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ABSTRACT

How does corporate governance affect bank capitalization strategies?

This paper examines how corporate governance and executive compensation affect bank capitalization strategies for an international sample of banks over the 2003-2011 period. 'Good' corporate governance, which favors shareholder interests, is found to give rise to lower bank capitalization. Boards of intermediate size, separation of the CEO and chairman roles, and an absence of anti-takeover provisions, in particular, lead to low bank capitalization. However, executive options and stock wealth invested in the bank is associated with better capitalization except just before the crisis in 2006. In that year stock options wealth was associated with lower capitalization which suggests that potential gains from taking on more bank risk outweighed the prospect of additional loss. Banks' tendency to continue payouts to shareholders after experiencing negative income shocks are shown to reflect executive risk-taking incentives.

JEL Classification: G21 and M21
Keywords: bank capital, corporate governance, dividend payouts and executive compensation

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1. Introduction

A failing bank can be defined as one that has insufficient capital. Bank capitalization strategies thus are crucial in determining the probability of bank failure at the individual-bank level and at the systemic level. Two key aspects of bank capitalization strategies can be distinguished.[1]

First, a bank has to determine its average, target level of bank capital. This average level of bank capital corresponds to the bank's expected level of capital before it is hit by any major negative shock that adversely impacts on bank capital. A higher average level of capital should increase a bank's chances of withstanding major income shocks. Confirming this, Berger and Bouwman (2013) find that higher levels of pre-crisis capital increase a bank's probability of survival during a banking crisis. Along similar lines, Beltratti and Stulz (2012) and Demirguc-Kunt, Detragiache and Merrouche (2013) find that banks that were better capitalized before the crisis had a better stock market performance during the crisis.

Second, a bank has to decide whether to cut its net payouts to bank stock investors after a negative income shock so as to preserve capital. A conservative bank would tend to reduce dividends and share repurchases and increase share issuance after experiencing major losses. Acharya, Gujral and Shin (2009), however, show that many of the world's largest banks continued to pay significant dividends in the initial phase of the crisis in 2008 before the demise of Lehman, putting the banks at risk.

Banks are subject to regulatory requirements in the form of minimum capital ratios and – depending on individual circumstances – restrictions on payouts to bank stock investors aiming to prevent capital shortfalls giving rise to bank failure. In practice, however, banks continue to enjoy considerable discretion in their capitalization policies. Using data for an

[1] This paper's findings, interpretations, and conclusions are entirely those of the authors and do not necessarily represent the views of the World Bank, its Executive Directors, or the countries they represent.

international sample of banks, in this paper we empirically examine various aspects of corporate governance structures and executive compensation schemes as potential drivers of bank capitalization strategies over the period 2003-2011.

Corporate governance is the set of rules that resolve the potential conflict between managers and shareholders. For banks, value-maximizing shareholders are likely to favor risky capitalization strategies to the extent that these maximize banks' prospects for receiving generous bailouts in the event of failure. In the empirical work, we explore how bank capitalization strategies are affected by a range of corporate governance features related to board size and composition, and to whether or not the firm is protected by anti-take-over provisions.

The relationship between board size and capitalization strategies is a priori ambiguous, as a larger board may be better able to represent shareholder interests because it is less easily captured by management, but on the other hand it may be less effective in promoting shareholder interests due to free rider problems within the board. Given the risk-taking incentives of shareholders, board independence from management and, more specifically, a board not chaired by the CEO, are expected to lead to riskier capitalization strategies. In contrast, anti-takeover provisions are expected to lead to less risky capitalization strategies, as a weaker market for corporate control implies that management can more easily pursue capitalization strategies that do not maximize shareholder value.

We also consider several executive compensation variables relating to the CEO's overall yearly compensation and its composition. A priori, the impact of these compensation variables on the riskiness of bank capitalization strategies is uncertain. More risky strategies may increase the expected value of executive financial wealth and perhaps even of executive human capital, analogously to the expected positive effect on overall bank stock market valuation. This suggests that managers' incentives to undertake risky capitalization strategies

may increase with measures of their overall income, and of their financial wealth relative to cash income as tied to the banks. However, executive income and wealth related to the bank are nondiversifiable, which may be why higher income and wealth associated with the bank may cause managers to pursue less risky bank capitalization strategies.

For US banks only, we also construct two additional executive compensation variables that measure the impact of share price movements, and increases in share price volatility, on executive wealth. A high sensitivity of executive wealth to share price movements - or a high 'delta' – provides executives with the incentive to reduce the riskiness of bank capitalization strategies to reduce risk to their wealth, while a high positive impact of increased share price volatility on executive wealth – a high 'vega' - is likely to increase the riskiness of capitalization strategies.

Turning to our main results, we find that 'good' corporate governance – or corporate governance that causes the bank to act in the interests of bank shareholders – engenders lower levels of bank capital. Specifically, we find that bank boards of intermediate size (big enough to escape capture by management, but small enough to avoid free rider problems within the board), separation of the CEO and chairman of the board roles, and an absence of anti-takeover provisions lead to lower capitalization rates. Our results thus suggest that 'good' corporate governance may be bad for bank stability and potentially entail high social costs.[2]

However, we do not find consistent evidence that corporate governance schemes that promote shareholder interests cause badly performing banks to continue relatively high payouts to shareholders. This may reflect that banks with 'good' corporate governance on average have relatively low capitalization rates, providing them no room to maintain relatively aggressive payout policies in the face of negative income shocks.

[2] Previously Laeven and Levine (2009) have shown that a high concentration of shareholders, which increases the comparative power of shareholders within corporate governance structures, increases bank risk taking.

Regarding executive compensation, we find that capitalization rates increase with CEO overall compensation, and also with CEO options and stock wealth invested in the firm relative to annual cash income during the overall 2003-2011 period. These results favor the interpretation that high executive income and wealth tied to the bank cause managers to increase capitalization so as to reduce the riskiness of their income and wealth. However, executive options wealth is associated negatively with bank capitalization in 2006 just prior to the financial crisis, when apparently the potential gains from taking on more bank risk outweighed the prospect of additional loss.

We find that executive options and shares wealth leads to a higher tendency for the bank to continue payouts to bank stock investors even if the bank performs badly, suggesting that higher executive wealth invested in the bank leads to riskier payout strategies. One explanation may be that executives fear that payout cuts could endanger their jobs or wealth (as the share price may drop on the news of lower payouts to shareholders), with these risks becoming more pronounced at higher levels of overall income and of wealth tied to the bank. For the case of US banks, we find that bank capitalization reflects the CEO's risk-taking incentives as summarized by delta and vega.

By now a significant literature exists on how corporate governance affects banks.[3] Existing papers primarily focus on two main issues: (i) the impact of corporate governance on ex ante risk-taking by banks, and (ii) the implications of corporate governance on how banks fared during the crisis.

Regarding the first question, Pathan (2009) finds that small boards and boards not controlled by the CEO lead to additional bank risk as reflected in market measures of risk and the Z-score for a sample of US bank holding companies over the 1997-2004 period. Chen, Steiner, and Whyte (2006), in turn, find a positive impact of option-based executive

[3] Recent surveys are offered by Becht, Bolton, and Roell (2011) and Mehran, Morrison and Shapiro (2012).

compensation on market measures of risk for a sample of US commercial banks during the period 1992-2000. DeYoung, Peng, and Yan (2010) further find that CEO risk-taking incentives lead to riskier business policy decisions (concerning loans to businesses, non-interest based banking activities, and investment in mortgage-backed securities) at US commercial banks over the 1994-2006 period.

Regarding the second issue, Berger, Bjorn, and Rauch (2012) find that high shareholdings of outside directors and chief officers imply a substantially lower probability of bank failure for US commercial banks over the 2007-2010 period. Fahlenbrach and Stulz (2011) find some evidence that US banks with CEOs whose incentives were better aligned with the interests of shareholders in 2006 had worse share price performance during the subsequent crisis. Ellul and Yerramilli (2013) report that US bank holding companies that had strong internal risk controls in place before the onset of the financial crisis fared better in terms of operating and stock performance during the crisis.

This study is also related to a significant literature that addresses how corporate governance affects corporate payout policy (i.e., through dividends or share repurchases), without looking specifically at financial firms or the crisis period. Fenn and Liang (2001), for instance, find that managers that own stock options are more likely to initiate share repurchases (rather than pay dividends), as these tend to lead to better share price performance. Along similar lines, Brown, Liang and Weisbenner (2007) find that the 2003 US dividend tax cut led to higher dividend payments (relative to share repurchases) in firms where executives have significant stock ownership. La Porta et al. (2000) find that firms pay higher dividends if located in countries with stronger minority shareholder rights. More general analyses of the evolution of dividends vs. share repurchases in the US and in Europe are offered by Jagannathan, Stephens, and Weisbach (2000), and Von Eije, and Megginson (2008).

Several empirical papers have considered capitalization rates of banks (Gropp and Heider, 2010; Keen and De Mooij, 2011), and the speed of adjustment towards a desired capitalization rate (De Jonghe and Oztekin, 2012,) using international data. However, these papers have not considered corporate governance issues.

At a theoretical level, Adams and Ferreira (2007) show that a management-dominated board may lead a firm to select better projects, as the dominant position of management enables it to reveal more information to non-management directors, thereby eliciting better advice from these directors without these directors being able to restrict management's ability to select projects that are privately beneficial. Bolton, Mehran and Shapiro (2011) show that excess risk-taking by banks can be addressed by basing executive compensation on both the stock price and the bank's CDS spread. The presence of deposit insurance and trusting debt holders, however, imply that it is not in shareholders' interests to design compensation contracts in this way. Edams and Liu (2011) show that debt-like instruments such as pension rights are generally part of the optimal compensation package so as to contain the agency costs of debt. John, Saunders and Senbet (2000) demonstrate that the FDIC insurance premium can be made dependent on incentive features of top-management compensation to eliminate excess bank risk-taking.

To conclude, the contribution of our paper is two-fold. First, we investigate the impact of both corporate governance and executive compensation schemes on bank capitalization strategies for the first time for an international sample of banks over the 2003-2011 period. Second, we are also able to investigate a potentially differential impact in 2006, just leading up to the international financial crisis.

In the remainder, section 2 discusses the data. Section 3 presents the emp irical results. The section 3 starts with an analysis of the determinants of average, target levels of bank capitalization. Then it considers the determinants of payouts to bank shareholders, with a

focus on badly performing banks. Finally, it considers the determinants of bank capitalization levels only in the year 2006, just preceding the financial crisis that started in 2007. Finally, section 4 concludes.

2. The data

We combine data on banks' capitalization ratios and payout behavior for an international sample of banks with data on key aspects of their corporate governance and executive compensation schemes. Accounting data and market data necessary to construct our capitalization and payout variables are taken from Bankscope of Bureau Van Dijk and Worldscope of Thomson Financial. Data on corporate governance for an international sample of banks for the years 2004-2008 are taken from the Corporate Governance Quotient (CGQ) data base assembled by Institutional Shareholder Services. Data on executive compensation internationally for the years 2003-2011 are from Compustat's Capital IQ. Finally, data on additional compensation variables only for US banks for the 2003-2011period are available from Compustat's ExecuComp. Table A1 in the Appendix provides all variable definitions and data sources and Table A2 reports country coverage.

We consider the impact of corporate governance and of executive compensation on five alternative indices of bank capitalization. First, Tier 1 capital is a regulatory capital ratio constructed as Tier 1 capital divided by risk-weighted assets, where Tier 1 capital and risk-weighted capital are calculated according to Basel rules. Tier 1 capital includes common equity and perpetual, non-cumulative preferred equity, and it can be seen as a measure of the funds cumulatively contributed by common and preferred shareholders that can be exhausted through losses while the bank remains a going concern. As seen in Table 1, the mean Tier 1 capital ratio in our sample is 11.9%.

Total capital is a broader regulatory capital ratio constructed as the sum of Tier 1 capital and Tier 2 capital divided by risk-weighted assets. Tier 2 capital includes hybrid capital, subordinated debt, loan loss reserves, and valuation reserves. Subordinated debt can only be used to offset a bank's losses, after the bank has ceased to be a going concern. Thus, not all of Tier 2 capital can be considered to be a buffer to protect a bank from insolvency. The average Tier 2 capital ratio is 13.7%.

Common equity is a narrower measure of bank capitalization constructed as common equity divided by total assets. This capitalization measure should be relevant to common shareholders, as it represents the capital that common shareholders have at stake. Common shareholder interests should be important to a bank's management and board, not least because common shareholders have voting rights. The denominator of the common equity ratio is total assets rather than risk-weighted assets, and hence insensitive to the potentially arbitrary and manipulable risk weighting of assets. The mean common equity ratio is 8.9%.

Common equity can be divided into tangible common equity and non-tangible common equity. The latter includes tax deferred assets, mortgage servicing rights, and minority interests in financial intermediaries. The loss absorption capacity of these various items is zero (as in the case of tax deferred assets) or limited (as in the case of mortgage servicing rights). To reflect this, we also consider the tangible equity ratio, constructed as tangible equity divided by tangible assets (i.e., total assets minus non-tangible assets). The tangible equity ratio has a mean of 7.9%.

Banks have some discretion over the book valuation of their assets and their capital. For this reason, capitalization measures based solely on accounting data may be misguided, especially during a time of economic and financial crisis. Therefore, we consider an additional capitalization measure, called market value, that is constructed as the ratio of the market value of the bank's common equity to a proxy for the market value of a bank's total

assets (computed as the sum of the book value of total assets and the market value of common equity minus the book value of common equity). This market-based measure of bank capitalization should be more accurate than corresponding accounting-based measures to the extent that bank stock investors are aware of distortions in the accounting valuation of bank assets. However, the market-based capital ratio can only be an imperfect measure of bank capitalization, as it also reflects the valuation of a bank's access to the financial safety net. Banks that are too big to fail, in particular, may have a higher market valuation than justified purely on the basis of extant bank capital, as they can count of being bailed out in case of financial distress. The average market value ratio is 12.2%.

Figures 1 through 5 provide information on the development of our 5 bank capitalization measure over the 2003-2011 period. Figures 1 and 2 show that the two regulatory capital measures, Tier 1 capital and Total capital, declined from 2004 to 2008, followed by significant increases afterwards to levels even higher than before the crisis. Figures 3 and 4 show that the Common equity ratio and the Tangible equity ratio declined during the crisis till 2009 and 2008, respectively, with relatively modest subsequent recoveries. Together these four pictures suggest that the increases in the regulatory ratios during 2009-2011 reflect a downward adjustment of the average risk-weighting of assets in addition to a decline in the leverage ratios based on common and tangible equity.

Figure 5, in turn, provides the time trend of the market value ratio. Interestingly, the time paths of the common equity ratio in Figure 3 and the market value ratio in Figure 5 look very similar until 2010, while they diverged in 2011: the uptick in the common equity ratio in 2011 is not followed by a corresponding increase in the market value ratio. This suggests that changes in the common equity ratio corresponded rather well with shareholders' perception of bank market value changes until 2010, but not in 2011. The discrepancy between Figures 1 and 2 on the one hand and Figure 5 on the other further suggests that the strong recoveries of

the regulatory capital ratios as seen in Figures 1 and 2 after 2008 are purely accounting-based, as there is no correspondingly strong recovery in the market value ratio.

We also consider four measures of payouts to bank shareholders: (i) dividends, (ii) share repurchases, (iii) the sum of dividends and share repurchases, denoted payout, and (iv) the sum of dividends and share repurchases minus share issuance to private shareholders, denoted net payout.[4] Corresponding to these four payout measures, we construct four dummy variables signalling whether or not a particular payout measure is positive. The Dividends dummy variable, for instance, signals whether or not a bank pays dividends. As seen in Table 1, 83.6% of the banks pay dividends in any given year; 58.3% of banks repurchase shares; 88.4% have a positive gross payout; and 75.6% have a positive net payout.

In addition, we consider four payout variables reflecting the funds returned to shareholders relative to total assets. Thus, the Dividends to assets variable is the ratio of dividends to total assets with a mean of 0.34%. The Repurchases to assets ratio, in turn, has a mean of 0.25%. The mean total payout to assets ratio is 0.60%, while the mean net payout to assets ratio is 0.48% (where this variable is truncated at zero).

Figures 6-9 display the time trends of the four payout variables as related to total assets over the 2003-2011 period. The Dividends to assets ratio is seen to increase until 2006, and to decline strongly afterwards, with a modest recovery in 2011. The Repurchases to assets ratio instead peaked in 2007, declined in 2008, and then stayed relatively low during 2009-2010 to increase again in 2011. The time path of the total payout to assets ratio also peaked in 2007, followed by declines until 2010 and a recovery in 2011. The net payout to assets ratio, finally, peaked in 2007, and then declined until 2009, to increase again in 2010 and 2011.

[4] The total payout variable abstracts from the choice between dividends and repurchases. Jagannathan, Stephens, and Weisbach (2000) find that dividends are paid by firms with 'permanent' operating cash flows, while repurchases are used by firms with 'temporary', non-operating cash flows. See Denis and Osobov (2008) and Von Eije and Megginson (2008) for analyses of which firms pay dividends and repurchase shares using international data.

Our corporate governance variables concern the size and composition of the bank's board and anti-takeover provisions as an index of the effectiveness of the market for corporate control. To start, Board independence is an indicator of the share of independent directors in the board; this variable ranges from 1 to 6, with a higher score indicating a higher share of independent directors. A more independent board is expected to better represent the interests of shareholders rather than of management. A more independent board, therefore, is hypothesized to favour more bank risk taking, which would serve to increase the valuation of the bank's contingent claim on the financial safety net as reflected in bank share prices. Bank risk taking, in contrast, may be relatively less favoured by bank managers, as they could lose their jobs in case of a bank failure. A more independent board could bring on more bank risk by condoning lower capitalization rates and by approving continued payouts to bank shareholders of badly performing banks.

Next, Board size is an indicator of the number of board members; this variable ranges from 1 to 5, with a higher score representing a larger board. A very small board may find it difficult to stand up to management, as the burden of doing so would fall on very few board members. A very large board may similarly be unable to effectively oppose management, as it could be subject to free-rider problems among its many members. This suggests that board effectiveness – in promoting shareholder interests - may be related to board size in a nonlinear fashion, with boards of intermediate size being the most effective. Boards of intermediate size thus may favour relatively risky bank capitalization strategies. To test for the possibly nonlinear relationship between board size and the riskiness of bank capitalization strategies, we include linear as well as squared board size variables in some specifications.

Alternatively, Board size, effective is a variable that takes a higher value if the headcount of board members is taken to imply a board that more effectively represents shareholder interests; this variable ranges from 1 to 3, with a higher score representing a more

effective board. The highest score of 3 is given to a board with an intermediate number of board members between 9 and 12.

Next, the CEO chairman separation variables indicates the degree to which the roles of CEO and chairman of the board are separated; the CEO chairman separation variable ranges from 1 to 3, with a higher score indicating better separation between the two roles. Effective separation of the CEO and chairman roles should enable a board to better promote the interests of shareholders giving rise to riskier capital-related bank strategies.

As a final corporate governance variable, the Anti-takeover provision variable is a dummy variable that equals one if the bank is incorporated in a country or state that allows a bank to adopt anti-takeover provisions. Such measures weaken the disciplining effect of the market for corporate control on bank management, possibly enabling managers to pursue less risky bank capitalization strategies. Consistent with this, Low (2009) found that an increase in take-over protection in Delaware in the mid-1990s caused managers to lower firm risk.

For an international sample of banks, we have information on CEO annual compensation packages and on this executive's ownership of options and shares from Capital IQ. To start, CEO total compensation is defined as the logarithm of overall annual compensation granted to the CEO. This variable represents options and shares granted as well as cash compensation, with a priori ambiguous implications for risk taking. In addition, we construct three variables that represent the significance of executive option and share ownership relative to annual cash compensation. To wit, CEO options is the logarithm of the value of options cumulatively granted to the CEO relative to current cash compensation. The impact of CEO options wealth on the CEO's incentive to take risk is a priori uncertain. Significant nondiversifiable options wealth may lead the CEO to pursue less risky banking strategies so as to preserve his wealth, especially if the options are deep in the money.

Options wealth, conversely, may induce higher risk taking, as the value of options increases in share price volatility, especially if the exercise price is close to the share price.

As an analogous variable, we construct CEO shares as the logarithm of the value of the shares cumulatively granted to the CEO relative to this cash compensation. Significant share ownership may lead the CEO to become more conservative to reduce the risk to his wealth. On the other hand, share ownership may induce additional risk taking as a bank's valuation may increase with bank risk, especially if the valuation of the bank is close to zero.

Next, the CEO portfolio variable represents the CEO's combined options and share wealth. Specifically, it is the logarithm of the value of the CEO's options and shares relative to cash compensation. The impact of CEO portfolio on bank risk taking is a priori again ambiguous.

The valuation data on executive option and stock wealth available from Capital IQ do not include details on exactly what options or shares are held. Hence, this information is too crude to compute executive risk taking incentives beyond those implicit in overall valuations. For US banks, more detailed information about executive options and stock packages is available from ExecuComp. For US banks only, therefore, we can measure executive risk taking incentives more precisely, as proxied by variables that indicate the impact of share price movements and increases in share price volatility on executive wealth. To wit, the CEO delta variable is the logarithm of the CEO's delta, defined as the dollar value change of the CEO's stock and option portfolio when the stock price increases by 1%. A high CEO delta suggests that the CEO has a lot of wealth at stake in the bank, and hence that the CEO will be inclined to take less risk.

Furthermore, CEO vega stands for the logarithm of the CEO's vega, defined as the dollar value change of a CEO's stock and options portfolio when the stock price volatility increases by 1%. A high CEO vega indicates that the CEO's wealth increases considerably

with increased share price risk, and hence it suggests that the CEO will be inclined to take more risk.

In our capitalization regressions, we use two bank-level control variables. First, Assets is the log of a bank's total assets. Second, return on assets is a bank's pre-tax profits divided by total assets, with a mean value of 0.65%

Finally, to proxy for negative bank income shocks we define the Income shock variable as minus the change in a bank's return on assets provided that it is in the lower quintile of the change in the rate of return on assets distribution; the Income shock variable is instead set to zero, if the change in the rate of return on assets is in the upper four quintiles of its distribution. The mean Income shock is 1.8%. Figure 10 shows the fraction of banks experiencing negative income shocks in any given year. As expected, the highest fractions of banks experiencing negative income shocks are seen during the crisis years since 2007.

3. Empirical results

This section presents empirical results of the impact of corporate governance and executive compensation on bank capitalization strategies. Subsection 3.1 focuses on bank capitalization ratios, while subsection 3.2 considers payouts of badly performing banks to bank stock investors. Subsection 3.3 considers bank capitalization ratios only for the year 2006, just prior to the recent financial crisis.

3.1 Results on bank capitalization ratios

Table 2 shows the results of regressions that relate bank capitalization variables to corporate governance variables. The regressions include two bank-level control variables. First, the assets variable proxying for bank size is expected to obtain negative coefficients, as large banks have an incentive to exploit their too-big-to-fail status by maintaining low

capitalization ratios. Second, the return to assets variable is expected to enter the regressions positively, as more profitable banks can more easily add to their capital buffers by retaining earnings (and not taking losses). All explanatory variables are lagged one period to reduce the potential for reverse causation.[5] Regressions include country/year fixed effects to control for time-varying, country-level determinants of capitalization rates such as the state of the business cycle. Standard errors are adjusted for clustering at the bank level.

Panel A shows the results of five capitalization regressions that include the board independence variable. This variable enters regressions for the four capitalization ratios purely based on accounting information (i.e., Tier 1 capital, Total capital, Common equity, Tangible equity) in columns 1-4 with negative and insignificant coefficients, while it enters the Market value regression in column 5 with a positive and insignificant coefficient.

In Panel B, the board size variable enters the Total capital regression in column 2 with a negative coefficient that is significant at 10%, possibly reflecting that a larger board better represents shareholder interests as served by a lower capitalization. The board size variable, in turn, enters the Market value regression in column 5 with a positive coefficient that is significant at 5%. A larger board thus appears to create market value for shareholders, perhaps precisely because it reduces a capitalization ratio such as the Total capital ratio.

In Panel C, the Board size, effective variable enters the Common equity and Tangible equity regressions in columns 3 and 4 with negative coefficients that are significant at the 1% level. Thus, boards of intermediate size appear to reduce capital ratios relative to unweighted assets, while they have no significant impact on the regulatory capital ratios relative to weighted assets in columns 1 and 2. These results together suggest that banks with an 'effective' board size are highly leveraged, while they invest in assets with low or no risk weighting such as government bonds to keep up their regulatory capital ratios.

[5] Doidge, Karolyi and Stulz (2007) find that country characteristics are much more important in explaining firm-level variations in governance ratings than observable firm characteristics. This is consistent with limited, if any, reverse causation from bank capitalization to bank corporate governance.

The capitalization regressions in Panel D include linear and squared terms in the Board size variable to further investigate whether board size has a nonlinear impact on bank capital ratios. The linear board size variable is seen to obtain negative and significant coefficients in the Common equity and Tangible capital regressions in columns 3 and 4, while the squared board size variable obtains positive and significant coefficients in these regressions. This is additional evidence that boards of intermediate size tend to reduce bank capital relative to unweighted assets, thereby increasing leverage as based on common and tangible equity.

In Panel E, the CEO chairman separation variable obtains a negative coefficient that is significant at 10% in the Tangible capital regression 4, providing some evidence that a board that is not dominated by the CEO can pursue a low-capitalization strategy in the interest of shareholders.

Finally, in Panel F the Anti-takeover provision variable obtains positive and significant coefficients in columns 1-3, while it obtains a negative and significant coefficient in the market value regression in column 5. Anti-takeover protection apparently enables management to pursue high-capitalization strategies as reflected in accounting-based capital ratios. This makes managers' jobs and wealth invested in the firm safer. Anti-takeover protection, however, reduces the market-based capitalization rate in column 5 with significance at 10%, perhaps precisely because high accounting-based capitalization reduces bank valuation.

Overall, the evidence of Table 2 suggests that boards or intermediate or larger size, separation of the CEO and chairman roles, and an absence of anti-takeover provisions lead to lower accounting-based capitalization ratios - as would be favoured by shareholders -, while a larger board and a lack of anti-takeover provisions appear to increase market-based capitalization.

Table 3 shows results of capitalization regressions that include executive compensation variables analogously to Table 2. The five regressions in Panel A that include the CEO total compensation variable yield insignificant coefficients for this variable, perhaps reflecting that the various components of total compensation can affect capital ratios in opposite directions.

Next, in Panel B the CEO options variable obtains positive and significant coefficients in the Common equity and Market value regressions in columns 3 and 5.[6] This suggests that CEOs with significant options wealth opt for high capitalization rates to reduce risk to their wealth.

The CEO shares variable, in turn, enters the capitalization regressions in columns 1-4 of Panel C with positive coefficients that are statistically significant. CEOs with significant CEO stock wealth appear to opt for higher capitalization rates so as to safeguard their wealth. Similarly, in Panel D we find that CEO portfolio variable, combing options and stock wealth, receives positive and significant coefficients in columns 1 and 3-5. Overall these results suggest that a CEO with significant options and stock wealth invested in a bank brings about higher capitalization rates to safeguard his wealth.[7]

Next, we consider capitalization regressions that include information on executive risk-taking incentives, as summarized by delta and vega, for US banks only. A higher delta signals that executive wealth is more sensitive to bank share price movements, which is expected to reduce bank risk-taking in the form of low capitalization rates. In contrast, vega measures the increase in executive wealth following a higher share price volatility. Vega

[6] Previously Houston and James (1995) found positive relationships between equity-based measures of CEO compensation and the bank's market-to-book value taken to be consistent with the hypothesis that compensation policies promote risk taking in banking.

[7] In analogous fashion we considered the impact of CFO compensation on bank capitalization rates finding similar results. Specifically, we do not find that capitalization rates are significantly related to CFO total compensation, while in some specifications they are positively and significantly related to CFO options wealth, CFO shares wealth, and to the sum of these (unreported).

should be a good proxy for an executive's incentive to take on more risk, and hence is expected to be associated with more bank risk taking.

In Table 4, CEO delta is estimated with positive and significant coefficients in the tangible equity and market value regressions 4 and 5, suggesting that a CEO with significant wealth at stake in his bank increases its capitalization.[8] The CEO vega variable, in turn, obtains negative and significant coefficients in the same two regressions, indicating that the CEO acts on his incentive to create share price risk by lowering capitalization ratios. Overall, bank capitalization is found to respond to bank risk taking incentives as summarized by delta and vega.[9]

3.2 Results on payouts to bank stock investors

In this subsection, we consider the impact of corporate governance and executive compensation on a bank's decision whether or not to continue channelling funds to shareholders in the face of negative income shocks.[10] We consider four alternative measures of payments to shareholders: dividends, share repurchases, the sum of these two, and the net payout defined as the sum of dividends and share repurchases minus share issuance to private investors. In the regressions, we examine the determination of four dummy variables signalling whether the corresponding payout measure is positive, and also four variables calculated as the corresponding payout relative to a bank's total assets.

To proxy for negative bank income shocks, we define the Income shock variable as minus the change in a bank's return on assets provided that it is in the lower quintile of the

[8] Chava and Purnanandam (2010) have studied the impact of executive risk-taking incentives on corporate policies for US firms generally finding that CEO's risk-decreasing incentives are associated with lower leverage.

[9] In analogous regressions, we do not find that bank capitalization rates are significantly related to CFO delta or CFO vega, which suggests that the CEO is more influential in determining bank capitalization rates than the CFO (unreported).

[10] A bank that is slow to reduce payments to shareholders in the face of negative income shocks can only slowly adjust its capital ratios towards target levels provided that it does not fail. See Byoun (2008), Huang and Ritter (2006), and Oztekin and Flannery (2012) for empirical analyses of how firms dynamically adjust their capital structures towards targets.

change in the return on assets distribution (while the Income shock variable is set to zero otherwise). We are particularly interested in which corporate governance and executive compensation features lead a bank to continue payouts to shareholders even after a negative income shock, thereby depleting bank capital further. To test this, the regressions include an interaction term of the Income shock variable and a particular corporate governance or executive compensation feature. A positive estimated coefficient for such an interaction term implies that the included corporate governance or executive compensation variable leads the bank to continuing payouts to shareholders after a negative income shock, further weakening the bank. A positive coefficient for any such interaction term thus means that the included corporate governance or executive compensation aspect facilitates a risky bank payout strategy.

We estimate probit models to explain variation in the payout dummy variables, while we use tobit models to explain payouts relative to assets. Both probit and tobit models include country/year fixed effects, and standard errors are adjusted for clustering at the bank level.

Table 5 reports the results of payout regressions that include a corporate governance feature. In the dividend dummy regression 1 of Panel A, the interaction of the Board independence variable and the income shock variable obtains a positive coefficient that is significant at 5%, supporting the hypothesis that independent boards serve the interests of shareholders by continuing to pay dividends in the face of negative income shocks.

In the repurchase dummy regression 2 of Panel B, the interaction term of the Board size and income shock variables obtains a negative coefficient that is significant at 10%. Thus, larger boards appear to act conservatively by stopping share repurchases in the face of negative shocks, possibly serving the interests of management rather than shareholders. The board size variable, however, is estimated to be insignificant in the payout to assets

regressions in columns 5-8, suggesting that larger boards do not significantly adjust payout size after negative shocks.

Next, ‘effective’ boards are estimated to discontinue dividend payments after experiencing a negative income shock in the dividend dummy regression 1 of Panel C, while there is no significant impact on the volume of dividends relative to assets in regression 5. Effective boards thus reduce the likelihood of dividend payments after a negative shock, without a corresponding reduction in the volume of dividends given that a dividend payment occurs.

Regression 7 of Panel D shows that total payouts relative to assets are positively and negative related to the interaction of board size and the income shock and the interaction of the squared board size and the income shock, respectively. This suggests that boards of intermediate size maintain higher total payouts to assets after experiencing losses.

Next, the positive and significant coefficient of for the CEO chairman separation variable in the dividend dummy regression 1 of Panel F suggests that such a separation facilitates the continuation of dividends after a negative income shock. However, the CEO chairman separation variable enters the total payments to assets regression in column 8 with a negative coefficient that is significant at 10%.

Finally, Panel F does not show a significant impact of anti-takeover provisions on payouts to bank shareholders following negative income shocks.

Overall, Table 5 shows inconclusive evidence on how corporate governance features conducive to promoting shareholder interests affect the continuation of payouts in the face of negative shocks. This could reflect that banks with corporate governance schemes favoring shareholder interests maintain lower capitalization rates on average as shown in Table 2, providing them with little room to continue payouts relatively aggressively in the face of negative income shocks.

Next, in Table 6 we consider how the payouts to shareholders of badly performing banks are related to executive compensation. Starting with CEO total compensation in Panel A, we see that the interaction of this variable with the income shock variable obtains positive and significant coefficients in the dividends dummy, total payout dummy and net payout dummy regressions in columns 1, 3 and 4, suggesting that CEOs with high total compensation keep up payouts to shareholders in the face of negative bank income shocks. The interaction of the CEO options variable and the income shock variable, in turn, is positively related to the payout variables in all 8 regressions in Panel B, while coefficients are statistically significant in 7 of these regressions. A CEO with considerable options wealth may be interested in continuing payouts to shareholders even if the bank performs badly, as this makes the bank stock more risky, possibly increasing option valuation. Alternatively, the CEO wants to keep up payouts, as lower payouts are interpreted as negative news by investors, possibly causing a decline in share as well as option valuation.

In Panel C, we see that the interaction of the CEO shares variable with the income shock variable is estimated with a positive and significant coefficient in the total payout dummy regression 3. Similarly, the interaction of the CEO portfolio variable and the income shock variable obtains coefficients that are positive and significant in the total payout and net payout dummy regressions 3-4 in Panel D. Overall, these results suggest that considerable CEO wealth invested in a bank leads the CEO to maintain payouts to shareholders in the face of negative income shocks.[11]

Combining the findings from Tables 3 and 6, we see that higher CEO wealth invested in the bank engenders higher capitalization rates and at the same time the maintenance of payouts to investors after negative income shocks. These two implications of higher CEO

[11] In regressions analogous to Table 6, we find that capitalization rates are positively and significantly related to CFO total compensation and to CFO total portfolio wealth (but not to its individual options and shares components) (unreported). These results suggest that the CEO is relatively important in determining bank payout policies in the face of negative income shocks.

wealth invested in the bank have apparent opposite implications for bank risk. However, these findings can be reconciled by noting that a bank with a higher capitalization rate is able to maintain payouts to bank stock investors longer while performing badly.

3.3 Results on bank capitalization ratios in 2006

In this section, we present evidence on capitalization rates for 2006 only. By 2006, banks have had several years to recover from any higher-than-average losses incurred following the worldwide recession at the beginning of the millennium. Thus, by 2006 most banks should have been able to get close to their 'optimal' capital ratios, no longer tainted by the previous large economic downturn. In addition, 2006 is an interesting year to consider, as it just precedes the recent financial crisis which started in 2007. Thus, information on bank capitalization strategies in 2006 tells us which banks chose to be prepared for a large financial crisis like the recent one.

Table 7 relates capitalization rates in 2006 to corporate governance features, analogously to Table 2. In Panel B, the board size variable is positive and significant in the Common equity regression in column 3 and in the Market value regression in column 5. The coefficient for this variable, instead, is estimated to be negative and insignificant in the Total capital regression in column 2 (while it is significant in the corresponding regression in Table 2). The apparent ambiguity of the impact of board size on capitalization may reflect the inherent nonlinearity of the relationship. The results in Panels C and D of Table 8 are very similar to the corresponding results in Table 2, suggesting that boards of intermediate size lead to lower capitalization levels. In Panel E, the CEO chairman separation variable obtains negative and significant coefficients in the Common equity, Tangible capital and Market value regressions in columns 3-5, providing evidence that a board not dominated by the chairman contributed to low capitalization rates in 2006 prior to the recent crisis. Finally,

Panel F of Table 7 shows that anti-takeover provisions are positively and significantly related to regulatory capital ratios in columns 1 and 2, as such provisions enable managers to maintain higher capital ratios than consistent with maximizing shareholder value.

Overall, the results of Table 7 indicate that corporate governance features favourable to shareholders (in particular, boards of intermediate size, CEO-chairman separation, and an absence of anti-takeover provisions) were associated with lower bank capitalization rates in 2006, just prior to the recent financial crisis.

Table 8 relates capitalization ratios in 2006 to international executive compensation variables. In Panel A, we see that CEO total compensation is positively and significantly related to the market value ratio in column 5, indicating that CEO compensation contributed to market-based capitalization in that year. In Panel B, the CEO options variable is estimated with negative and significant coefficients in the regulatory capital ratio regressions in columns 1 and 2, while this variable contributes positively and significantly to the market value ratio in column 5.[12] Apparently, CEO options wealth was effective in reducing regulatory capital ratios and in increasing the market valuation of bank capital in 2006.

The negative and significant estimated coefficients for the CEO options variable in columns 1 and 2 of Panel B (based on 2006 data) are in contrast to the insignificant coefficients in the corresponding columns in Panel B of Table 3 and the positive and significant coefficients in columns 3 and 5 in this panel (based on 2003-2011 data). On average as based on a longer time period, higher CEO options wealth invested in the bank thus appears to lead to higher capital ratios but not in the year 2006, which exceptionally preceded a major banking crisis.[13]

[12] Analogously, we find that the CFO options variable obtains negative coefficients of -0.002 in the two regulatory capital ratio regressions that are significant at 10%, while it obtains a positive coefficient of 0.004 that is significant at 1% in the market-based capitalization regression (unreported). These results suggest that CFO options wealth had a similar but smaller negative impact on regulatory bank capital ratios in 2006.

[13] In robustness checks we estimated the regressions of Panel B of Table 8 for each year over the 2003-2011 period. These regressions show that 2006 was the only year when the CEO options variable was negatively and

4. Conclusion

For an international sample of banks over the 2003-2011 period, we find that 'good' corporate governance – or corporate governance that causes the bank to act in the interests of bank shareholders – engenders lower levels of bank capital. Specifically, we find that bank boards of intermediate size (big enough to escape capture by management, but small enough to avoid free rider problems within the board), separation of the CEO and chairman of the board roles, and an absence of anti-takeover provisions lead to lower capitalization rates. 'Good' corporate governance thus may be bad for bank stability and potentially entail high social costs. This disadvantage of 'good' corporate governance has be balanced with presumed benefits in terms of restricting management's ability to perform less badly in other areas – for instance, by shirking or acquiring perks – at the expense of bank shareholders.

However, we do not find consistent evidence that corporate governance schemes that promote shareholder interests cause badly performing banks to continue relatively high payouts to shareholders. This may reflect that banks with 'good' corporate governance on average have relatively low capitalization rates, providing them no room to maintain relatively aggressive payout policies in the face of negative income shocks.

Further, we find that capitalization rates increase with CEO overall compensation, and also with CEO options and stock wealth invested in the firm relative to annual cash income when considering the entire sample period from 2003 to 2011. These results favor the interpretation that high executive income and wealth tied to the bank cause managers to increase capitalization so as to reduce the riskiness of their income and wealth. However, executive options wealth is associated negatively with bank capitalization in 2006 prior to the

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significantly related to regulatory capital ratios (unreported). This variable in contrast in positively and significantly related to all five capital ratios apart from the Tier 1 capital ratio in 2009, indicating that CEO options wealth was related positively to capital ratios during the crisis (unreported).

financial crisiswhen apparently the potential gains from taking on more bank risk outweighed the prospect of additional loss.

We find that our executive options and shares wealth lead to a higher tendency for the bank to continue payouts to bank stock investors even if the bank performs badly, suggesting that higher executive wealth invested in the bank lead to riskier payout strategies. This may be because executives fear that payout cuts could endanger their jobs or wealth (as the share price may drop on the news of lower payouts to shareholders), with these risks becoming more pronounced at higher levels of overall income and of wealth tied to the bank. For the case of US banks, we find that bank capitalization only reflects the CEO's risk-taking incentives as summarized by delta and vega.

Our findings have important policy implications. In reform discussions since the crisis, the potentially nefarious impact of 'good' governance on bank risk-taking often fails to be recognized. The European Commission (2010, p. 6), for instance, states that the board of directors were unable to exercise effective control over senior management and that directors' failure to identify, understand and ultimately control the risks to which their financial institutions were exposed was at the heart of the origins of the crisis.

The UK Parliamentary Commission on Banking (2013, p. 40 and p. 42) similarly concludes that many non-executive directors failed to act as an effective check on, and challenge to, executive managers, recommending the appointment of a Senior Independent Director ensuring that the relationship between the CEO and the Chairman does not become too close and that the Chairman performs his or her leadership and challenge role. This proposed change in the corporate governance of banks potentially increases bank risk-taking as long as boards act on the principle of shareholder primacy (section 172 of the Companies Act of 2006). However, the UK Parliamentary Commission (2013, p. 42) simultaneously recommends to remove shareholder primacy with respect to banks, requiring directors of

banks to ensure the financial safety and soundness of the company ahead of the interests of its members. These policy assessments ignore that more effective boards and good corporate governance practices may well increase bank risk taking beyond the level preferred by senior management and they suggest first and foremost that reforms need to address policies that distort risk-taking incentives of shareholders, such as too-big-to-fail policies and government guarantees.

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Appendix

Table A1. Variable definitions and data sources

Variable	Definition	Source
Tier 1 capital	Ratio of Tier 1 capital to risk-weighted assets	WorldScope
Total capital	Ratio of Tier 1 capital and Tier 2 capital to risk-weighted assets	WorldScope
Common equity	Ratio of common equity to total assets	WorldScope
Tangible capital	Ratio of tangible capital to tangible assets	BankScope
Market value	Market value of common equity divided by total assets plus market value of common equity minus book value of common equity	WorldScope
Dividends	Dummy variable that equals one if the bank pays dividends, and zero otherwise	WorldScope
Repurchases	Dummy variable that equals one if the bank repurchases common shares, and zero otherwise	WorldScope
Payout	Dummy variable that equals one if the bank has a positive payout in terms of dividends and repurchases of common shares, and zero otherwise	WorldScope
Net payout	Dummy variable that equals one if the bank has a positive payout in terms of dividends and repurchase of common shares net of common share issuance, and zero otherwise	WorldScope
Dividends to assets	Ratio of dividends to total assets	WorldScope
Repurchases to assets	Ratio of repurchases of common shares to total assets	WorldScope
Payout to assets	Ratio of sum of dividends and purchases of common shares to total assets	WorldScope
Net payout to assets	Ratio of sum of dividends and repurchase of common shares net of common share issuance to assets if positive, and zero otherwise	WorldScope
Board independence	Variable ranging from 1 to 6, with a higher value indicating a more independent board	ISS CGQ
Board size	Variable ranging from 1 to 5, with a higher score indicating a larger board membership. Specifically, board size = 1 if board membership < 6; board size = 2 if board membership ≥ 6 and ≤ 8; board size = 3 if board membership ≥ 9 and ≤ 12; board size = 4 if board membership ≥ 13 and ≤ 15; board size = 5 if board membership > 15	ISS CGQ
Board size, effective	Variable ranging from 1 to 3, with a higher value indicating a more effective number of board members. Specifically board size, effective = 1 if board membership is < 6 or board membership > 15; board size, effective = 2 if board membership ≥ 6 and ≤ 8 or board membership ≥ 13 and ≤ 15; board size, effective = 3 if board membership ≥ 9 and ≤ 12.	ISS CGQ
CEO chairman separation	Variable ranging from 1 to 3, with a higher value indicating better separation between the roles of CEO and chairman	ISS CGQ
Anti-takeover provision	Dummy variable that equals one if a bank is in a state or country enabling anti-takeover provisions	ISS CGQ
CEO total compensation	Logarithm of the value of total annual compensation granted to CEO	Capital IQ
CEO options	Logarithm of the ratio of the cumulative value of options granted to CEO to his annual cash compensation	Capital IQ
CEO shares	Logarithm of the ratio of the cumulative value of shares granted to CEO to his annual cash compensation	Capital IQ
CEO portfolio	Logarithm of the ratio of the cumulative value of options and shares granted to CEO to his annual cash compensation	Capital IQ
CEO delta	Logarithm of the CEO's delta, defined as the dollar value change of the CEO's stock and option portfolio when the	ExecuComp

	stock price increases by 1%.	
CEO vega	Logarithm of the CEO' vega, defined as the dollar value change of a CEO's executive's stock and option portfolio when the stock price volatility increases by 1%.	ExecuComp
Assets	Lorgarithm of total assets	BankScope
Return on assets	Ratio of pre-tax profits to total assets	BankScope
Income shock	Minus the change in the return on assets if the change in the returns on assets is in the bottom 20% of the distribution of this variable, and zero otherwise	Bankscope

Table A2. Country coverage

The table provides information on the number of banks per country for which governance and compensation variables are available. Specifically, columns 1 and 2 indicate the number of distinct banks per country that are included in regression (1) of Table 2 that includes the board independence variable, while columns 3 and 4 indicate the number of distinct banks per country that are included in regression (1) of Table 3 that includes the CEO options variable.

	Governance variable coverage		Compensation variable coverage	
Country	Number of banks (1)	Percentage (2)	Number of banks (3)	Percentage (4)
Austria	3	0.33	1	0.09
Australia	10	1.09	15	1.34
Belgium	6	0.66	3	0.27
Canada	11	1.20	15	1.34
Switzerland	6	0.66	23	2.05
Germany	11	1.20	12	1.07
Denmark	2	0.22	7	0.62
Spain	4	0.44	6	0.54
Finland	1	0.11	4	0.36
France	3	0.33	11	0.98
United Kingdom	24	2.63	37	3.30
Greece	6	0.66	1	0.09
Hong Kong	14	1.53	17	1.52
Ireland	4	0.44	3	0.27
Israel	0	0.00	7	0.62
Italy	14	1.53	29	2.59
Japan	66	7.22	3	0.27
Netherlands	3	0.33	10	0.89
Norway	2	0.22	14	1.25
Portugal	3	0.33	2	0.18
Sweden	5	0.55	7	0.62
Singapore	6	0.66	1	0.09
United States	710	77.68	893	79.66
Total	914	100.00	1121	100.00

Table 1. Summary statistics

This paper provides summary statistics for all variables. For variable definitions see Appendix A.

Variable	Obs	Mean	Std. Dev.	Min	Max
Tier 1 capital	5364	0.1188673	0.0392783	0.0003	0.397
Total capital	5485	0.1368712	0.0365603	0.0007	0.3978
Common equity	6856	0.0888915	0.045354	0.0004571	0.399141
Tangible capital	5717	0.07876	0.0446112	0	0.3997
Market value	6708	0.1219877	0.0686786	0	0.3982863
Dividends	7045	0.8361959	0.370124	0	1
Repurchases	7037	0.5833452	0.4930397	0	1
Payout	7044	0.8838728	0.3204001	0	1
Net payout	6924	0.7560659	0.4294845	0	1
Dividend to assets	7002	0.0033658	0.0050477	0	0.0914464
Repurchase to assets	7035	0.0024998	0.0058447	0	0.0825852
Payout to assets	7042	0.006001	0.0100387	0	0.1876903
Net payout to assets	6922	0.0048165	0.0090896	0	0.1862391
Board independence	3604	3.866815	1.325686	2	6
Board size	3707	3.100081	0.9861247	1	5
Board size, effective	3707	2.307526	0.7090921	1	3
CEO chairman separation	3349	2.227829	0.9273435	1	3
Anti-takeover provision	3711	0.8905955	0.3121881	0	1
CEO total compensation	6195	13.24145	1.277642	0	17.48077
CEO options	2984	-0.0671694	1.765786	-9.542555	8.200547
CEO shares	1380	-0.7764621	1.653062	-8.163483	14.74349
CEO portfolio	1918	-0.4246851	1.78749	-9.542555	14.74349
CEO delta	843	4.754275	1.692002	0	9.841147
CEO vega	678	3.393811	1.615134	0.0054059	7.937679
Assets	6355	8.364944	2.342639	1.35293	15.12358
Return on assets	6817	0.0065276	0.0186397	-0.1991605	0.195753
Income shock	1079	0.017989	0.0225871	0.003785	0.2247179

Table 2. Bank capitalization ratios and corporate governance, 2004-2008

The dependent variables in columns 1 to 5 are Tier 1 capital, Total capital, Common equity, Tangible capital and Market value, respectively. Tier 1 capital is the ratio of Tier 1 capital to risk-weighted assets. Total capital is the ratio of Tier 1 capital and Tier 2 capital to risk-weighted assets. Common equity is the ratio of common equity to total assets. Tangible capital is the ratio of tangible capital to tangible assets. Market value is the market value of common equity divided by total assets plus the market value of common equity minus the book value of common equity. Assets is the logarithm of total assets. Return on assets the ratio of pre-tax profits to total assets. Board independence is a variable ranging from 1 to 6, with a higher value indicating a more independent board. Board size is a variable ranging from 1 to 5, with a higher score indicating a larger board membership. Board size, effective is a variable ranging from 1 to 3, with a higher value indicating a more effective number of board members. CEO chairman separation is a variable ranging from 1 to 3, with a higher value indicating better separation between the roles of CEO and chairman. Anti-takeover provision is a dummy variable that equals 1 if a bank is in a state or country enabling anti-takeover provisions. Regressions in Panels B-F also include the Lagged assets and Lagged return on assets variables which are unreported. Regressions include country-year fixed effects. Standard errors are adjusted for clustering at the bank level, and provided in parentheses. *, ** and *** denote significance at 10%, 5%, and 1%, respectively.

	Tier 1 capital	Total capital	Common equity	Tangible capital	Market value
Panel A	(1)	(2)	(3)	(4)	(5)
Lagged assets	-0.008***	-0.004***	-0.005***	-0.009***	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Lagged returns on assets	0.747***	0.695***	1.445***	1.144**	2.641***
	(0.278)	(0.257)	(0.440)	(0.514)	(0.868)
Lagged board independence	-0.001	-0.001	-0.001	-0.001	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	2131	2207	2429	2289	2384
adj. R-sq	0.182	0.099	0.257	0.270	0.393
Panel B					
Lagged board size	-0.002	-0.003*	0.003	-0.001	0.005**
	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)
N	2171	2247	2475	2328	2430
adj. R-sq	0.201	0.114	0.275	0.276	0.400
Panel C					
Lagged board size, effective	-0.002	-0.002	-0.007***	-0.005***	-0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
N	2171	2247	2475	2328	2430
adj. R-sq	0.200	0.112	0.286	0.281	0.397
Panel D					
Lagged board size	-0.009	-0.012	-0.022***	-0.019***	-0.001
	(0.009)	(0.008)	(0.006)	(0.006)	(0.009)
Lagged board size squared	0.001	0.002	0.004***	0.003***	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	2171	2247	2475	2328	2430
adj. R-sq	0.202	0.116	0.287	0.282	0.401
Panel E					
Lagged CEO chairman separation	0.000	-0.000	-0.002	-0.002*	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
N	2036	2042	2203	2042	2171
adj. R-sq	0.187	0.090	0.293	0.373	0.471
Panel F					
Lagged anti-takeover provision	0.011***	0.011***	0.008**	0.005	-0.013*
	(0.003)	(0.003)	(0.004)	(0.004)	(0.007)
N	2171	2247	2476	2329	2431

adj. R-sq	0.204	0.116	0.273	0.276	0.395

Table 3. Bank capitalization ratios and executive compensation internationally, 2003-2011

The dependent variables in columns 1 to 5 are Tier 1 capital, Total capital, Common equity, Tangible capital and Market value, respectively. Tier 1 capital is the ratio of Tier 1 capital to risk-weighted assets. Total capital is the ratio of Tier 1 capital and Tier 2 capital to risk-weighted assets. Common equity is the ratio of common equity to total assets. Tangible capital is the ratio of tangible capital to tangible assets. Market value is the market value of common equity divided by total assets plus the market value of common equity minus the book value of common equity. Assets is the logarithm of total assets. Return on assets the ratio of pre-tax profits to total assets. CEO total compensation is the logarithm of the value of total annual compensation granted to CEO. CEO options is the logarithm of the ratio of the cumulative value of options granted to CEO to his annual cash compensation. CEO shares is the logarithm of the ratio of the cumulative value of shares granted to CEO to his annual cash compensation. CEO portfolio is the logarithm of the ratio of the cumulative value of options and shares granted to CEO to his annual cash compensation. Regressions in Panels B-D also include the Lagged assets and Lagged return on assets variables which are unreported. Regressions include country-year fixed effects. Information on stock grant is recorded in Capital IQ from 2006. The regressions in Panel C-D, therefore, cover only the period of 2007-2011. Standard errors are adjusted for clustering at the bank level, and provided in parentheses. *, ** and *** denote significance at 10%, 5%, and 1%, respectively.

	Tier 1 capital	Total capital	Common equity	Tangible capital	Market value
	(1)	(2)	(3)	(4)	(5)
Panel A					
Lagged assets	-0.012***	-0.011**	-0.012***	-0.017***	-0.031***
	(0.004)	(0.005)	(0.005)	(0.003)	(0.005)
Lagged returns on assets	0.257**	0.193*	0.462***	0.352***	0.575***
	(0.102)	(0.108)	(0.123)	(0.103)	(0.151)
Lagged CEO total compensation	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	4637	4625	5122	5160	4962
adj. R-sq	0.077	0.069	0.127	0.167	0.625
Panel B					
Lagged CEO options	0.000	-0.000	0.001*	0.001	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	2414	2407	2701	2514	2648
adj. R-sq	0.087	0.096	0.059	0.161	0.581
Panel C					
Lagged CEO shares	0.002*	0.002*	0.002**	0.002**	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	889	886	981	978	965
adj. R-sq	0.132	0.137	0.163	0.137	0.323
Panel D					
Lagged CEO portfolio	0.001*	0.001	0.002***	0.002***	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	1255	1255	1363	1365	1341
adj. R-sq	0.136	0.139	0.166	0.128	0.377

Table 4. Bank capitalization ratios and executive incentives for the US case, 2003-2011

The dependent variables in columns 1 to 5 are Tier 1 capital, Total capital, Common equity, Tangible capital and Market value, respectively. Tier 1 capital is the ratio of Tier 1 capital to risk-weighted assets. Total capital is the ratio of Tier 1 capital and Tier 2 capital to risk-weighted assets. Common equity is the ratio of common equity to total assets. Tangible capital is the ratio of tangible capital to total assets. Market value is the market value of common equity divided by total assets plus the market value of common equity minus the book value of common equity. Assets is the logarithm of total assets. Return on assets the ratio of pre-tax profits to total assets. CEO delta is the logarithm of the CEO's delta, defined as the dollar value change of the CEO's stock and option portfolio when the stock price increases by 1%. CEO vega is the logarithm of the CEO's vega, defined as the dollar value change of a CEO's stock and option portfolio when the stock price volatility increases by 1%. Regressions include country-year fixed effects. Standard errors are adjusted for clustering at the bank level, and provided in parentheses. *, ** and *** denote significance at 10%, 5%, and 1%, respectively.

	Tier 1 capital	Total capital	Common equity	Tangible capital	Market value
	(1)	(2)	(3)	(4)	(5)
Lagged assets	0.002	0.006	-0.009	-0.021**	-0.046***
	(0.008)	(0.008)	(0.005)	(0.008)	(0.010)
Lagged returns on assets	0.032	0.084	0.426**	0.016	0.649**
	(0.273)	(0.268)	(0.193)	(0.196)	(0.267)
Lagged CEO delta	0.004	0.002	0.002	0.006*	0.007***
	(0.005)	(0.005)	(0.002)	(0.003)	(0.003)
Lagged CEO vega	-0.009	-0.008	-0.002	-0.006*	-0.006**
	(0.006)	(0.006)	(0.002)	(0.004)	(0.002)
N	515	512	652	522	640
adj. R-sq	0.134	0.135	0.117	0.169	0.686

Table 5. Payouts to shareholders of badly performing banks and corporate governance, 2004-2008

The dependent variables in columns 1-4 are Dividends, Repurchases, Payout and Net payout, respectively. Dividends is a dummy variable that equals one if the bank pays dividends, and zero otherwise. Repurchases is a dummy variable that equals one if the bank repurchases common shares, and zero otherwise. Payout is a dummy variable that equals one if the bank has a positive payout in terms of dividends and repurchases of common shares, and zero otherwise. Net payout is a dummy variable that equals one if the bank has a positive payout in terms of dividends and repurchase of common shares net of common share issuance, and zero otherwise. The dependent variables in columns 5-8 are Dividends to assets, Repurchases to assets, Payout to assets and Net payout to assets, respectively. Dividends to assets is the ratio of dividends to total assets. Repurchases to assets is the ratio of repurchases of common shares to total assets. Payout to assets is the ratio of the sum of dividends and purchases of common shares to total assets. Net payout to asset is the ratio of the sum of dividends and repurchase of common shares net of common share issuance to assets if positive, and zero otherwise. Income shock is minus the change in the return on assets if the change in the return on assets is in the bottom 20% of the distribution of this variable, and zero otherwise. Board independence is a variable ranging from 1 to 6, with a higher value indicating a more independent board. Board size is variable ranging from 1 to 5, with a higher score indicating a larger board membership. Board size, effective is a variable ranging from 1 to 3, with a higher value indicating a more effective number of board members. CEO chairman separation is a variable ranging from 1 to 3, with a higher value indicating better separation between the roles of CEO and chairman. Columns 1-4 show the results of probit model estimation, while columns 5-8 show the results of Tobit model estimation. Regressions in Panels B-E also include the Income shock variable which is unreported. Regressions include country-year fixed effects. Standard errors are adjusted for clustering at the bank level, and provided in parentheses. *, ** and *** denote significance at 10%, 5%, and 1%, respectively.

	Probit				Tobit			
Panel A	Dividends (1)	Repurchase (2)	Payout (3)	Net payout (4)	Dividends to assets (5)	Repurchases to assets (6)	Payout to assets (7)	Net payout to assets (8)
Lagged Income shock	-150.003***	-19.360	-82.445***	-2.887	-0.217**	0.136	-0.071	-0.022
	(50.815)	(30.501)	(28.505)	(13.442)	(0.108)	(0.186)	(0.128)	(0.119)
Lagged Board independence	0.052	0.085**	0.028	0.002	0.000	0.000*	0.000	0.000
	(0.058)	(0.037)	(0.062)	(0.042)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged Board independence * Lagged Income shock	30.736**	-1.215	15.452	-4.364	0.034	-0.071	-0.015	0.009
	(14.366)	(8.776)	(9.577)	(4.920)	(0.029)	(0.053)	(0.037)	(0.048)
N	2147	2238	2085	2205	2299	2301	2301	2270
pseudo R-sq	0.048	0.049	0.043	0.080	-0.015	-0.022	-0.013	-0.018
Panel B								
Lagged Board size	0.237***	0.002	0.204***	0.008	0.000**	-0.000	0.000	-0.000
	(0.077)	(0.046)	(0.071)	(0.048)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged Board size * Lagged Income shock	-8.275	-12.248*	-6.615	4.862	0.003	-0.030	0.014	0.008
	(9.400)	(7.157)	(6.187)	(3.466)	(0.023)	(0.051)	(0.032)	(0.025)
N	2173	2260	2105	2231	2334	2336	2336	2303
pseudo R-sq	0.076	0.050	0.081	0.087	-0.016	-0.025	-0.014	-0.019
Panel C								
Lagged Board size, effective	0.131*	0.029	0.021	0.045	-0.000	0.000	-0.000	-0.000

	(0.079)	(0.059)	(0.084)	(0.061)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged Board size, effective * Lagged Income shock	-19.213**	-3.174	-7.550	-7.096	-0.029	0.038	0.011	0.018
	(8.043)	(10.334)	(7.877)	(5.297)	(0.031)	(0.095)	(0.050)	(0.034)
N	2173	2260	2105	2231	2334	2336	2336	2303
pseudo R-sq	0.060	0.049	0.065	0.087	-0.016	-0.024	-0.014	-0.019
Panel D								
Lagged Board size	0.563**	0.094	0.086	0.253	0.000	-0.000	-0.000	-0.000
	(0.281)	(0.211)	(0.308)	(0.246)	(0.001)	(0.001)	(0.001)	(0.001)
Lagged Board size squared	-0.056	-0.017	0.022	-0.039	-0.000	-0.000	0.000	0.000
	(0.046)	(0.033)	(0.050)	(0.037)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged Board size * Lagged Income shock	-18.924	3.300	52.740	1.700	0.080	0.176	0.222*	0.331
	(31.846)	(27.967)	(52.722)	(31.506)	(0.076)	(0.144)	(0.127)	(0.222)
Lagged Board size squared * Lagged Income shock	4.458	0.746	-8.866	0.458	-0.009	-0.023	-0.029*	-0.045
	(5.086)	(3.776)	(8.727)	(4.253)	(0.010)	(0.019)	(0.017)	(0.030)
N	2228	2316	2160	2231	2390	2392	2392	2303
pseudo R-sq	0.093	0.051	0.112	0.088	-0.016	-0.025	-0.014	-0.020
Panel E								
Lagged CEO chairman separation	-0.102	-0.047	-0.106	0.022	-0.000	-0.001**	-0.001**	-0.000
	(0.069)	(0.045)	(0.067)	(0.046)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged CEO chairman separation * Lagged Income shock	21.531**	-7.757	6.140	-9.993	0.029	-0.044	0.007	-0.091*
	(10.558)	(10.710)	(8.007)	(6.683)	(0.027)	(0.074)	(0.043)	(0.048)
N	1872	1962	1859	1938	2038	2040	2040	2011
pseudo R-sq	0.044	0.042	0.066	0.085	-0.013	-0.029	-0.012	-0.019
Panel F								
Lagged Anti-takeover provisions	0.626***	0.178	0.415*	0.578***	0.002***	0.000	0.001	0.002**
	(0.229)	(0.174)	(0.227)	(0.175)	(0.001)	(0.001)	(0.001)	(0.001)
Lagged Anti-takeover provisions * Lagged Income shock	34.573	3.233	25.164	23.572	0.003	0.039	0.037	0.128
	(37.526)	(20.968)	(20.281)	(16.666)	(0.087)	(0.107)	(0.101)	(0.087)
N	2174	2260	2106	2232	2335	2337	2337	2304
pseudo R-sq	0.073	0.050	0.078	0.098	-0.017	-0.025	-0.015	-0.020

Table 6. Payouts to shareholders of badly performing banks and executive compensation internationally, 2003-2011

The dependent variables in columns 1-4 are Dividends, Repurchases, Payout and Net payout, respectively. Dividends is a dummy variable that equals one if the bank pays dividends, and zero otherwise. Repurchases is a dummy variable that equals one if the bank repurchases common shares, and zero otherwise. Payout is a dummy variable that equals one if the bank has a positive payout in terms of dividends and repurchases of common shares, and zero otherwise. Net payout is a dummy variable that equals one if the bank has a positive payout in terms of dividends and repurchase of common shares net of common share issuance, and zero otherwise. The dependent variables in columns 5-8 are Dividends to assets, Repurchases to assets, Payout to assets and Net payout to assets, respectively. Dividends to assets is the ratio of dividends to total assets. Repurchases to assets is the ratio of repurchases of common shares to total assets. Payout to assets is the ratio of the sum of dividends and purchases of common shares to total assets. Net payout to asset is the ratio of the sum of dividends and repurchase of common shares net of common share issuance to assets if positive, and zero otherwise. Income shock is minus the change in the return on assets if the change in the return on assets is in the bottom 20% of the distribution of this variable, and zero otherwise. CEO total compensation is the logarithm of the value of total annual compensation granted to CEO. CEO options is the logarithm of the ratio of the cumulative value of options granted to CEO to his annual cash compensation. CEO shares is the logarithm of the ratio of the cumulative value of shares granted to CEO to his annual cash compensation. CEO portfolio is the logarithm of the ratio of the cumulative value of options and shares granted to CEO to his annual cash compensation. Columns 1-4 show the results of Probit model estimation, while columns 5-8 show the results of Tobit model estimation. Information on stock grants is recorded in Capital IQ from 2006. The regressions in Panel C-D therefore cover only the period of 2007-2011. Regressions in Panels B-D also include the Income shock variable which is unreported. Regressions include country-year fixed effects. Standard errors are adjusted for clustering at the bank level, and provided in parentheses. *, ** and *** denote significance at 10%, 5%, and 1%, respectively.

			Probit				Tobit	
	Dividends	Repurchase	Payout	Net Outflow	Dividends to assets	Repurchases to assets	Payout to assets	Net payout to assets
Panel A	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lagged Income shock	-116.703***	-11.170	-104.034***	-64.524***	-0.139	-0.223	-0.194	-0.022
	(41.941)	(31.781)	(38.923)	(31.462)	(0.361)	(0.274)	(0.405)	(0.053)
Lagged CEO total compensation	0.104***	0.151***	0.161***	0.059***	0.000	0.001***	0.001***	0.001**
	(0.030)	(0.032)	(0.035)	(0.022)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged CEO total compensation * Income shock	6.700**	0.542	6.566**	4.134*	0.011	0.016	0.017	0.034
	(3.156)	(2.324)	(2.789)	(2.241)	(0.025)	(0.020)	(0.029)	(0.039)
N	4445	4545	4408	4153	4666	4707	4703	4288
pseudo R-sq	0.095	0.077	0.109	0.052	-0.022	-0.045	-0.018	-0.020
Panel B								
Lagged CEO options	-0.054*	0.097***	-0.021	-0.092***	-0.000	0.001***	0.001***	0.000
	(0.032)	(0.025)	(0.037)	(0.028)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged CEO options * Lagged Income shock	13.318**	7.405*	18.929***	7.445	0.101**	0.052*	0.119**	0.080**
	(5.702)	(4.501)	(6.927)	(5.430)	(0.049)	(0.030)	(0.049)	(0.037)
N	2421	2424	2418	2306	2448	2455	2453	2336
pseudo R-sq	0.018	0.032	0.026	0.038	-0.007	-0.024	-0.013	-0.014
Panel C								

Lagged CEO shares	0.111**	0.188***	0.210***	0.027	0.000**	0.001***	0.001***	0.001***
	(0.046)	(0.037)	(0.049)	(0.039)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged CEO shares * Lagged Income shock	-0.346	1.966	2.801**	2.142	0.001	0.018	-0.026	-0.037
	(2.576)	(1.424)	(1.360)	(1.434)	(0.008)	(0.015)	(0.045)	(0.043)
N	937	937	938	832	922	937	938	832
pseudo R-sq	0.131	0.106	0.190	0.072	-0.011	-0.032	-0.010	-0.016
Panel D								
Lagged CEO portfolio	0.095***	0.172***	0.178***	0.009	0.000*	0.001***	0.001***	0.001***
	(0.037)	(0.029)	(0.044)	(0.030)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged CEO portfolio * Lagged Income shock	2.022	1.951	3.486***	2.791*	0.012	0.019	-0.009	-0.022
	(2.566)	(1.364)	(1.318)	(1.469)	(0.008)	(0.015)	(0.031)	(0.033)
N	1273	1274	1273	1139	1282	1298	1299	1161
pseudo R-sq	0.112	0.095	0.159	0.078	-0.011	-0.036	-0.009	-0.017

Table 7. Bank capitalization ratios and corporate governance, 2006

The dependent variables in columns 1 to 5 are Tier 1 capital, Total capital, Common equity, Tangible capital and Market value, respectively. Tier 1 capital is the ratio of Tier 1 capital to risk-weighted assets. Total capital is the ratio of Tier 1 capital and Tier 2 capital to risk-weighted assets. Common equity is the ratio of common equity to total assets. Tangible capital is the ratio of tangible capital to tangible assets. Market value is the market value of common equity divided by total assets plus the market value of common equity minus the book value of common equity. Assets is the logarithm of total assets. Return on assets the ratio of pre-tax profits to total assets. Board independence is a variable ranging from 1 to 6, with a higher value indicating a more independent board. Board size is variable ranging from 1 to 5, with a higher score indicating a larger board membership. Board size, effective is a variable ranging from 1 to 3, with a higher value indicating a more effective number of board members. CEO chairman separation is a variable ranging from 1 to 3, with a higher value indicating better separation between the roles of CEO and chairman. Anti-takeover provision is a dummy variable that equals 1 if a bank is in a state or country enabling anti-takeover provisions. Regressions in Panels B-F also include the Lagged assets and Lagged return on assets variables which are unreported. Regressions include country-year fixed effects. Standard errors are adjusted for clustering at the bank level, and provided in parentheses. *, ** and *** denote significance at 10%, 5%, and 1%, respectively.

Panel A	Tier 1 capital (1)	Total capital (2)	Common equity (3)	Tangible capital (4)	Market value (5)
Lagged assets	-0.008***	-0.005***	-0.004***	-0.008***	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Lagged returns on assets	0.253	0.295	1.307***	1.859***	5.511***
	(0.572)	(0.570)	(0.272)	(0.357)	(1.104)
Lagged board independence	-0.002	-0.001	-0.000	-0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
N	459	492	535	487	524
adj. R-sq	0.206	0.114	0.261	0.312	0.379
Panel B					
Lagged board size	-0.001	-0.002	0.003*	-0.001	0.006**
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
N	471	504	548	498	537
adj. R-sq	0.226	0.124	0.306	0.327	0.409
Panel C					
Lagged board size, effective	-0.001	-0.002	-0.009***	-0.004**	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
N	471	504	548	498	537
adj. R-sq	0.226	0.123	0.325	0.331	0.403
Panel D					
Lagged board size	-0.010	-0.014	-0.027***	-0.014**	0.005
	(0.011)	(0.009)	(0.008)	(0.007)	(0.008)
Lagged board size squared	0.001	0.002	0.005***	0.002**	0.000
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
N	471	504	548	498	537
adj. R-sq	0.225	0.126	0.326	0.330	0.408
Panel E					
Lagged CEO chairman separation	-0.001	-0.002	-0.003*	-0.004**	-0.005**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
N	445	450	480	428	473
adj. R-sq	0.222	0.098	0.277	0.335	0.385
Panel F					
Lagged anti-takeover provision	0.011**	0.012***	0.007	0.004	-0.010
	(0.005)	(0.004)	(0.005)	(0.005)	(0.008)

N	471	504	548	498	537
adj. R-sq	0.230	0.128	0.302	0.327	0.404

Table 8. Bank capitalization ratios and executive compensation internationally, 2006

The dependent variables in columns 1 to 5 are Tier 1 capital, the Total capital, Common equity, Tangible capital and Market value, respectively. Tier 1 capital is the ratio of Tier 1 capital to risk-weighted assets. Total capital is the ratio of Tier 1 capital and Tier 2 capital to risk-weighted assets. Common equity is the ratio of common equity to total assets. Tangible capital is the ratio of tangible capital to total assets. Market value is the market value of common equity divided by total assets plus market value of common equity minus book value of common equity. Assets is the lorgarithm of total assets. Return on assets the ratio of pre-tax profits to total assets. CEO total compensation is the logarithm of the value of total annual compensation granted to CEO. CEO options is the logarithm of the ratio of the cumulative value of options granted to CEO to his annual cash compensation. Regressions in Panel B also include the Lagged assets and Lagged return on assets variables which are unreported. Regressions include country-year fixed effects. Standard errors are adjusted for clustering at the bank level, and provided in parentheses. *, ** and *** denote significance at 10%, 5%, and 1%, respectively.

	Tier 1 capital (1)	Total capital (2)	Common equity (3)	Tangible capital (4)	Market value (5)
Panel A					
Lagged assets	-0.009***	-0.007***	-0.005***	-0.010***	-0.009***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Lagged returns on assets	0.322	0.185	1.234***	0.976**	2.534***
	(0.299)	(0.301)	(0.303)	(0.470)	(0.530)
Lagged CEO total compensation	0.003	0.004	0.001	0.001	0.016***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)
N	583	585	622	555	603
adj. R-sq	0.155	0.064	0.220	0.238	0.261
Panel B					
Lagged CEO options	-0.004***	-0.003**	-0.001	-0.001	0.004**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
N	430	431	453	383	445
adj. R-sq	0.096	0.029	0.089	0.190	0.269

Figure 1. This figure displays the unweighted yearly mean of Tier 1 capital, which is the ratio of Tier 1 capital to risk weighted assets.

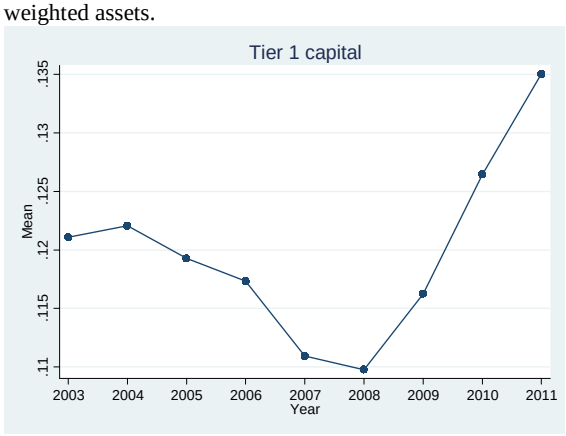

Figure 2. This figure displays the unweighted yearly mean of Total capital, which is the ratio of Tier 1 plus Tier 2 capital to risk weighted assets.

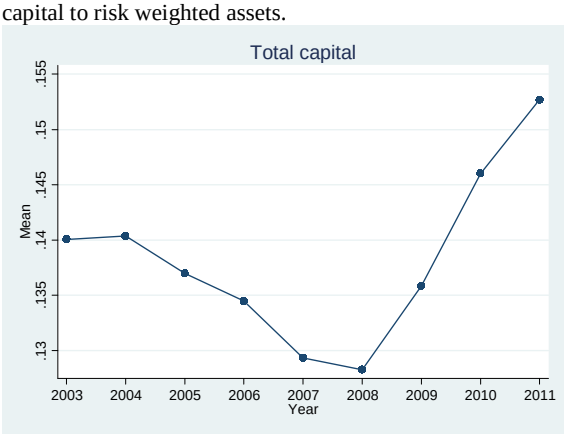

Figure 3. This figure displays the unweighted yearly mean of common equity, which is the ratio of the book value of common equity to total assets.

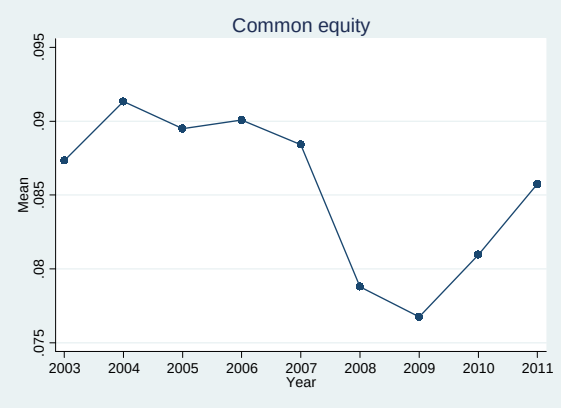

Figure 4. This figure displays the unweighted yearly mean of tangible capital, which is the ratio of tangible capital to tangible assets.

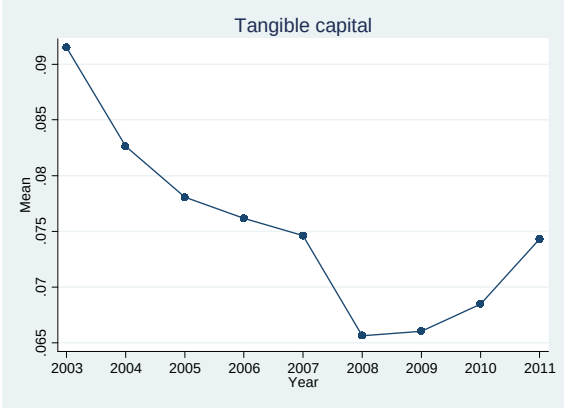

Figure 5. This figure displays the unweighted yearly mean of market value, which is the market value of common equity divided by total assets plus the market value of common equity minus the book value of common equity.

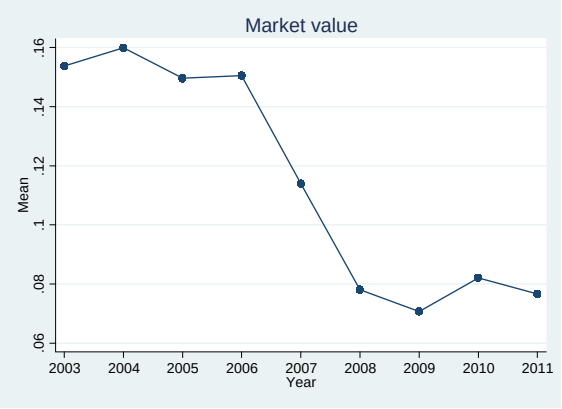

Figure 6. This figure displays the unweighted yearly average ratio of dividends to total assets.

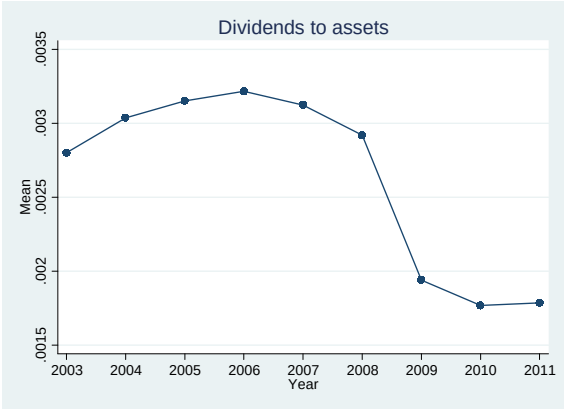

Figure 7. This figure displays the unweighted yearly average ratio of stock repurchases to total assets.

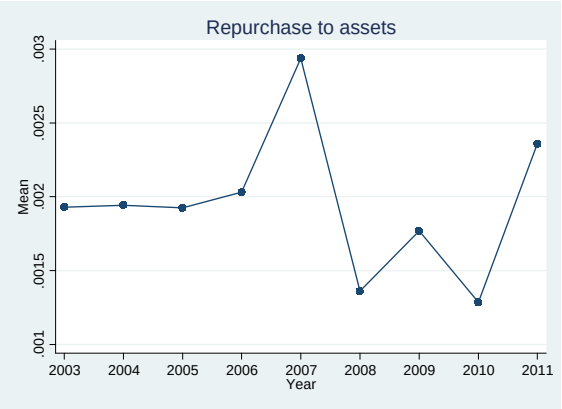

Figure 8. This figure displays the unweighted yearly average ratio of total payout (dividends plus repurchases) to total assets.

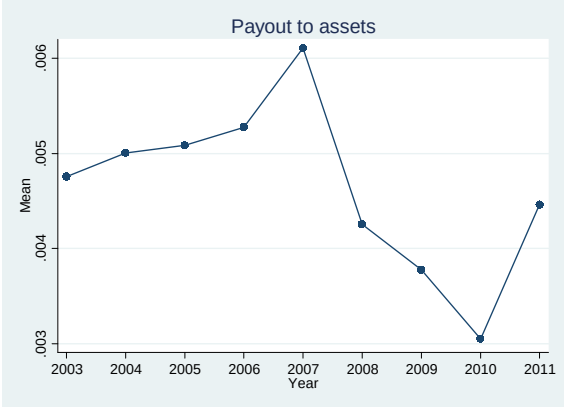

Figure 9. This figure displays the unweighted yearly average ratio of the payout net of private stock issuance to total assets. The value is negative when issuance exceeds the sum of dividends and repurchases.

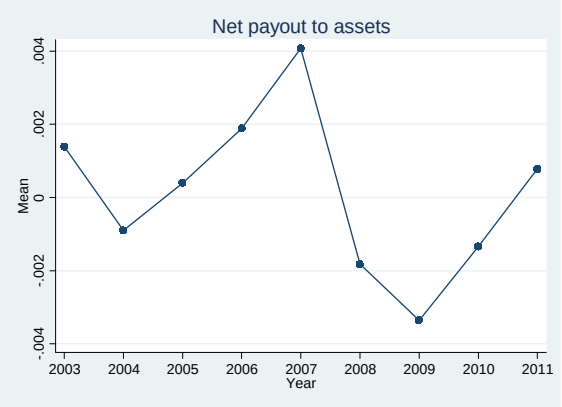

Figure 10. The figure displays the fraction of banks that experienced income shocks over time. An income shock is defined as the change in returns of assets is in the bottom 20% of the sample.