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CEO Pay Incentives and Risk-taking: Evidence from Bank Acquisitions

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Abstract

We analyze how the structure of executive compensation affects the risk choices made by bank CEOs. For a sample of acquiring U.S. banks, we employ the Merton distance to default model to show that CEOs with higher pay-risk sensitivity engage in risk-inducing mergers. Our findings are driven by two types of acquisitions: acquisitions completed during the last decade (after bank deregulation had expanded banks' risk-taking opportunities) and acquisitions completed by the largest banks in our sample (where shareholders benefit from 'too big to fail' support by regulators and gain most from shifting risk to other stakeholders). Our results control for CEO pay-performance sensitivity and offer evidence consistent with a causal link between financial stability and the risk-taking incentives embedded in the executive compensation contracts at banks.

JEL Classification: G21; G34; G33; J33
Key words: banks; mergers; default risk; CEO compensation

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1 Introduction

The use of incentive pay in banking is widely believed to have motivated excessive risk-taking and, thus, to have acted as a contributory factor to the recent financial crisis (e.g., Bebchuk and Spamann, 2009; Board of Governors et al., 2010). However, the empirical evidence on whether and how pay incentives affect risk-taking in the banking industry is surprisingly limited and the results are mixed at best. The purpose of this paper is to analyze how incentives embedded in executive compensation contracts determine the risk-taking behavior of bank CEOs. Our paper offers a novel approach. We study how CEO pay affects investment choices by using a sample of mergers and acquisitions (M&A) — one of the most important investment strategies undertaken by CEOs. This paper examines the relationship between the incentive structure of executive compensation and the default risk effects of mergers on the acquiring bank.

Over the past two decades, successive merger waves have changed the face of U.S. banking by giving rise to banks that are both larger and engage in a broader range of financial activities. A key factor behind consolidation in the banking industry has been the federal deregulation of banking. In particular, the Gramm-Leach-Bliley Act (GLBA) of 1999 has permitted U.S. commercial banks to diversify into non-traditional activities and has facilitated mergers with institutions which engage in capital market activities and insurance underwriting.

Next to M&A, bank deregulation is associated with sharp increases in the share of equity-based CEO compensation in the banking industry (Hubbard and Palia, 1995; Chen et al., 2006, Cuñat and Guadalupe, 2009). Equity-based compensation may affect corporate investment choices by making the CEO wealth sensitive to both company risk and performance (Guay, 1999). The sensitivity of CEO wealth to firm risk (which we refer to hereafter as *vega* and which measures the changes in CEO wealth generated by changes in stock return volatility) may induce risky investment choices by CEOs who seek to benefit from increases in share price volatility which result from risky investments. Furthermore, the sensitivity of CEO wealth to company performance (which we refer to hereafter as *delta* and which captures changes in CEO wealth caused by share price performance) may motivate CEOs to make value-creating investment choices.

In the banking industry, the use of stock options in executive compensation has become so widespread over the last decade that the contractual risk-taking incentives for CEOs at large U.S. banks (as captured by vega) are now higher than at non-financial firms (DeYoung et al., 2010). The magnitude of recent increases in CEO vega is also evident in our sample of acquiring banks. For instance, National City Corp. has seen CEO vega increase from $34,000 to $850,000 between 1993 and 2007. Similarly, Harris Simons, CEO of Zions Bank Corp., has seen the vega embedded in his compensation contracts increase from $900 to $140,000 between 1996 and 2006.

There are two main explanations for the recent increase in CEO vegas in the banking industry. The first explanation holds that, because deregulation expanded managerial discretion over the scale and scope of banking activities, performance contracts became more equity-based in order to encourage bank CEOs to take advantage of this growing investment opportunity set (Smith and Watts, 1992; Mehran and Rosenberg, 2007). Increases in risk-linked compensation are, therefore, consistent with agency theory, which suggests that optimal CEO compensation needs to align the interests of risk-averse managers with those of risk-neutral shareholders by motivating managers to commit to risk-increasing but positive net present value (NPV) projects (Jensen and Meckling, 1976; Amihud and Lev, 1981; Smith and Stulz, 1985). According to this view, increases in the risk sensitivity of executive compensation are designed to encourage bank managers to exploit the new opportunities — many of them fee-based and more risky than traditional banking activities (see Stiroh, 2006) — which deregulation had opened up.

The second explanation for higher CEO risk-taking incentives postulates that incentive-based compensation in banking is designed to shift risk from bank shareholders to regulators and bondholders (Crawford et al. 1995). Since banks are highly-leveraged institutions, shareholders benefit from higher-risk investment choices, which increase the potential value of bank assets while keeping the downside risk limited (John and John, 1993; Bebchuk and Spamann, 2009). These risk-shifting incentives for bank CEOs are further exacerbated by deposit insurance and the operation of implicit bail-out policies which insulate many bank creditors from losses in the event of institutional failure and, hence, reduce their propensity to limit excessive risk-taking by CEOs (see John et al., 2000; John et al., 2010).

In this paper, we focus on the effect of CEO vega on the realized risk implications of bank mergers. Our study offers a new approach by employing a specific corporate investment decision (M&A) as a laboratory to examine the effects of equity-based pay on the risk choices made by bank CEOs. The market for corporate control provides a suitable setting for this, because M&As are one of the most important resource allocation decisions made by CEOs. In addition, because mergers are clearly defined investment strategies, we can relate observable changes in bank risk following a deal to CEO risk-taking incentives.

Previous evidence on vega and the investment decisions made by managers is equivocal. For instance, the non-financial literature finds that higher CEO vegas lead to riskier investment choices and bind corporate resources to riskier activities (Nam et al. 2003; Coles et al. 2006; Rajgopal and Shevlin, 2002; Guay 1999). For the banking industry, Mehran and Rosenberg (2007) and DeYoung et al. (2010) show that high-vega banks engage in riskier types of activities. By contrast, Fahlenbrach and Stulz (2011) do not find that CEO vegas explain the performance of bank stocks (i.e. previous managerial risk-taking) during the recent financial crisis.

Our study also controls for the effects of CEO pay-performance sensitivity (delta) on the riskiness of merger decisions. However, our main focus is on vega, because the implications of delta on managerial risk-taking are theoretically and empirically ambiguous. On the one hand, high-delta compensation should increase managerial effort to identify and commit to risky and positive NPV projects. On the other hand, higher levels of pay-performance sensitivity will expose managers to company risk to a larger degree than diversified shareholders, which implies that higher deltas could exacerbate managerial risk-aversion (Smith and Stulz, 1985; Amihud and Lev, 1981). DeYoung et al. (2010) find some evidence that delta reduces the riskiness of bank activities, while Mehran and Rosenberg (2007) do not detect any robust influence of delta on bank risk-taking. As regards the effect of CEO delta on the riskiness of merger decisions, Datta et al. (2001) find that higher deltas lead to acquisitions which are associated with higher increases in stock return volatility after a merger. For the banking industry, Bliss and Rosen (2001) and Minnick et al. (2011) show that high-delta banks are less likely to engage in acquisitions, which is consistent with high-delta CEOs forgoing risky investment projects such as M&A.

We start by showing that CEO vegas at acquiring banks are highest in the time period following GLBA and at the largest banks. Next, we show higher contractual risk-taking incentives cause bank CEOs to engage in risk-increasing merger strategies. However, the effect of vega on the merger-related risk effects is driven by deals completed in the post-GLBA period and by larger banks — suggesting that bank CEOs have responded to increased contractual risk-taking incentives in these two subgroups. Furthermore, the finding that high-vega CEOs at the largest banks commit to risk-inducing mergers is consistent with large banks seeking to extract gains for shareholders by engaging in risk-shifting strategies (Crawford et al., 1995: Benston et al., 1995). Overall, our results are consistent with the view that executive compensation practices at banks have contributed to the recent financial crisis and that attempts to employ executive compensation policy to align the interests of managers and shareholders through higher risk-taking incentives are unlikely to limit risk-taking in the banking industry.

This paper makes several contributions. First, we contribute to the literature on the link between executive compensation in banking and financial stability (Houston and James, 1995; DeYoung et al. 2010; Mehran and Rosenberg, 2007; Chen et al. 2006). Previous work in this area has focused on the type of investment choices associated with certain CEO pay structures rather than on the realized risk effects of CEO investment choices. Our study is the first to examine whether a causal relationship exists between CEO pay and risk-taking in the banking sector by studying a specific investment decision. Second, previous work on management compensation and risk-taking analyzes risk on the basis of either market indicators (Chen et al., 2006; Datta et al., 2001) or accounting indicators (Rajgopal and Shivaram, 2002; Coles et al. 2006; Mehran and Rosenberg, 2007). By contrast, our study is the first to examine CEO incentives on bank risk-taking using a Merton distance to default (DD) model. As shown by Gropp et al. (2006), DD scores, which draw on both accounting and market data, are an appropriate indicator of bank fragility which outperform pure market measures of risk such as subordinated bond spreads over most examination periods. Moreover, default risk is a suitable indicator which is likely to affect managerial behavior owing to the negative implications that institutional failure has for the reputation and career paths of bank management (Mehran and Rosenberg, 2007).

Finally, we contribute to the bank merger literature. The lack of empirical work that reports either positive wealth effects for bidding bank shareholders or performance improvements surrounding bank M&A continues to raise questions as to who benefits from bank consolidation (see DeYoung et al., 2009 for an overview of the recent literature). Our study helps answer this question by examining the risk implications of U.S. bank M&A. Given the call option properties of equity which limit the downside risk for investors, shareholders may benefit from risk-inducing mergers when these increase the riskiness of the financial institution and expose them to potentially large gains.

The paper proceeds as follows. Section 2 describes the sample of bank mergers. Section 3 discusses the methodology used to measure the default risk effects of mergers and reports the DD implications of U.S. bank mergers. In Section 4, we discuss the methodology employed to measure the contractual risk-taking incentives for bidding bank CEOs and present some evidence on how these vary by the time period considered and by bidding bank size. We analyze the role of vega in determining the risk effects produced by bank M&As in Section 5, before testing the robustness of our findings in Section 6. Section 7 concludes.

2 The Sample

The merger data is obtained from Thomson Financial's Mergers and Acquisitions database (SDC Platinum). We include acquisitions which were announced between 1993 and 2007 (and completed no later than January 2008) by listed Bank Holding Companies (BHCs) (National Commercial Banks (SIC 6021) and State Commercial Banks (SIC 6022)). To enable us to assess the risk effects of financial diversification, sample deals may also involve the following target institutions next to BHCs: personal credit institutions (SIC 6141), life- and non-life insurance (6311, 6411), brokerage firms (6211) and financial advisors (6282). Furthermore, we exclude self-tenders, leveraged buyouts and recapitalizations. Sample deals are valued at more than $25 million and lead to the bidding institution owning more than 50% of the target's equity. This gives us an initial sample of 1,462 deals.

We then apply further selection criteria to the initial sample. First, we match the merger sample with Standard & Poor's ExecuComp database to obtain pay and board data for the acquiring bank's CEO in the fiscal year before the acquisition announcement. Since ExecuComp's coverage is restricted to banks currently or previously included in the S&P 500, S&P MidCap 400 and S&P SmallCap 600, we eliminate many observations at this point. Where ExecuComp has incomplete records of the acquiring bank, we recover missing data from proxy statements filed with the Securities and Exchange Commission (form DEF-14A). Finally, bidding BHCs need to have quarterly financial data available on the Federal Reserve System (filed on Y-9C reports) and equity data on the CRSP database. Applying these criteria yields 355 deals.

We then omit observations for the following reasons. We verify the deal data against news reports from various sources on LexisNexis. Inconsistencies between the news coverage surrounding a deal and the information provided by SDC were corrected or, if left unresolved, deals were omitted (this affected 14 deals). We deleted a further ten deals which involved failing banks (as indicated by SDC or the press coverage of a deal). We then stipulated that the CEO must have been in office for at least one year before a sample deal was announced. This sampling criterion ensures that the CEO would have been motivated by existing pay structures at the bidding bank. We lose 21 deals as a result.

Finally, we consolidate the resulting 275 individual announcements into 185 bank acquisitions by stipulating that there must be at least 180 trading days between separate acquisitions and no further deals pending until 180 days following the completion of a deal. If bidders make overlapping acquisition announcements within this time frame, we follow Furfine and Rosen (2009) and treat these announcements as a single deal. For overlapping announcements, we weight deal characteristics by the value of the constituent deals and exclude deals which remain uncompleted within a two-year period (from announcement of the first deal to completion of the last deal).[1] We then require that the ratio of the deal

[1] Our main results are invariant to us dropping overlapping announcements from the sample. However, if we did not allow for the possibility of multiple acquisitions, our sample size would be reduced to 117 deals. The vast majority of overlapping bank merger announcements are completed over a time period of less than three months and we would lose this relevant share of the sample were we to exclude them.

value to the acquirer's market value is higher than 1%. This reduces the sample by 13 observations to 172 acquisitions.[2]

[Table 1 near here]

Table 1 provides an overview of the final sample. A high number of deals are announced between 1993 and 1997. As reported in Panel B, our sample of 172 bank mergers are completed by 77 unique acquirers.

3 The Risk Effects of Bank Mergers

Bank mergers offer bidding banks opportunities to realize size-related diversification gains through risk pooling between institutions whose asset returns are less than perfectly correlated (Craig and Santos, 1997). To the extent that bank acquisitions enhance profitability as a result of increased market power and changes in the management of the assets of the combined institution, mergers may lower the default risk of bidding banks even further.

Previous work on the realized risk effects in banking has not computed default risk, but instead relied on accounting (e.g. z-scores) or equity-based indicators of risk. The latter typically uses stock returns to estimate a market model which decomposes total risk into systematic (beta) and idiosyncratic risk. In this paper, we study the merger-related changes in the default risk of bidding banks using the Merton distance to default (DD) model as in Vallascas and Hagendorff (2011), Akhigbe et al. (2007) and Gropp et al. (2006). One of the critical advantages of DD in the context of M&A is that it implicitly captures a bank's expected returns via the inclusion of the market value of assets. Default risk is measured as the number of standard deviations that the market value of bank assets are above default point (the point where the market value of assets is less than the book value of total liabilities). Formally, DD on day *t* is expressed as:

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[2] We do not stipulate a relative size requirement above 1% as this would further reduce our sample size. Most of the sample deals are sufficiently large to expect a measurable impact on the riskiness of the acquiring institution. In our sample, average relative size stands at 18.83%.

$$\mathrm{DD}_t = \frac{\ln\left(V_{A,t}/L_t\right) + \left(r - 0.5\sigma_{A,t}^2\right)T}{\sigma_{A,t}\sqrt{T}} \tag{1}$$

where $V_{A,t}$ is the market value of assets, L_t is the book value of total liabilities, r is the risk-free rate (proxied by the yield on 1-year U.S. treasury bills), $\sigma_{A,t}$ is the annualized asset volatility at t (computed via the estimation of equity volatility in a rolling window of 90 trading days), and T is the time to maturity (conventionally set to one year). Further details on how we estimated DD are provided in Appendix A.

We define merger-related changes in bidder distance to default as the difference in mean DD after the merger has been completed (over c+11 days to c+180 days following the completion date c) and mean DD before a deal (over a-180 days to a-11 days relative to the merger announcement date a). We choose this time window to reduce the level of noise inherent in DD and to ensure that our default risk predictions incorporate accounting data that relates to the post-merger period.

We eliminate general industry and time trends in default risk by computing a daily default risk index for a sample of non-merging banks. For every deal, we compute a DD market index as the value-weighted DD of all banks on CRSP that are not involved in M&A during the merger announcement and completion window. Changes in the pre-merger and post-merger value of the market default index are then subtracted from the changes in DD that acquirers realize over the same time period. As a consequence, the industry-adjusted change in distance to default (ΔIADD) for bidding banks that is due to M&A can be expressed as:

$$\begin{aligned}\Delta\mathrm{IADD} &= \overline{\mathrm{DD}}_{(c+11;c+180)} - \overline{\mathrm{DD}}_{(a-180;a\text{-}11)} - \left(\overline{\mathrm{DD}}_{index,(c+11;c+180)} - \overline{\mathrm{DD}}_{index,(a-180;a\text{-}11)}\right) \\ &= \Delta\mathrm{DD}_{bidder} - \Delta\mathrm{DD}_{index}\end{aligned} \tag{2}$$

Table 2 below reports ΔIADD for the complete sample as well as for specific types of deals. We present ΔIADD by whether a deal involves banks chartered in different states (geographic diversification); the first two digits of the SIC codes of the institutions involved in a deal are identical (product diversification); the deal was announced before or after the passing of GLBA; and by bidding bank size (relative to the median of the distribution of total assets in our sample). Since the number of sample deals completed in the post-GLBA period and the number of deals completed by large banks are of similar magnitude, the question arises whether there is a substantial overlap between these two subgroups of deals (in effect, are larger acquirers more frequently found in the post-GLBA period as a result of ongoing consolidation in the banking industry?). To address this issue, Table 3 displays deal characteristics for large and small acquirers and shows that large acquirers are fairly evenly distributed across the pre- and post-GLBA periods in our sample. As a result, overlap between bank classifications according to completion time and bank size is of negligible order.

Overall, the conclusion from Tables 2 and 3 is that bank mergers do not produce significant changes in the distance to default of bidding banks. This observation holds for all subsets of mergers we examine, with the exception of intra-state deals which experience a reduction in average DD (i.e. an increase in default risk) in the post-merger period (significant at 10% in Table 2) — a result which appears to be driven by the subset of large acquirers in our sample (see Table 3).[3]

[Table 2 & Table 3 near here]

The finding that bank mergers do not reduce default risk is consistent with the wider bank merger literature which is critical of the realized risk diversification effects of U.S. bank mergers. For instance, Craig and Santos (1997) examine changes in the z-scores of acquiring U.S. banks and find that mergers do not impact the riskiness of acquiring banks. Similarly, Amihud et. al. (2002) show that cross-border bank mergers do not affect the market risk of acquiring banks. In theory, the potential for merger-related risk reductions should be particularly pronounced for either geographically- or activity-diversifying mergers, because both types of deals have the potential to substantially lower the volatility of bank profits (Boyd et al., 1993). However, diversifying mergers may lead to increased organizational complexity and/or significant changes in post-merger strategy which may thwart bidders from realizing risk benefits as a result of M&A (Knapp et al., 2005). Akhavein et al. (1997) show that geographic diversification may leave the

[3] In unreported tests, we also examine whether differences in the merger-induced changes between the subgroups of deals are statistically significant. With the exception of geographic diversification — where the increases in DD for inter-state mergers are lower than for bank mergers within states (mean and median differences are significant below 10%) — we do not find statistically significant differences in ΔIADD between different types of bank mergers.

overall level of risk unaffected if banks — against the background of a more diversified loan portfolio — sharply increase lending in the post-merger period.[4]

4 Compensation Incentives of Acquiring Bank's CEOs

Mehran and Rosenberg (2007) argue that executive compensation changes the risk profile of a bank by altering managerial preferences for certain investment strategies. CEO investment choices are likely to be influenced by various types of incentives embedded in compensation contracts. Relatively simple proxies of equity-based compensation (such as the value of exercised or outstanding options in a given year) ignore the incentive effects exerted by previously granted option and stock grants and will, therefore, yield only weak explanations for the risk-taking incentives of managers (Guay, 1999). In this paper, we employ Core and Guay's (2002) method to measure CEO incentives to increase risk (vega) and to increase share prices (delta).

Data on option and stock grants is extracted from Standard & Poor's ExecuComp database and is complemented by data from SEC proxy filings where ExecuComp data is incomplete. The computations of vega and delta are as follows:

$$\text{vega} = \frac{\partial \text{value}}{\partial \sigma} \times .01 = e^{-dT} N'(Z) S \sqrt{T} \times .01 \tag{3}$$

$$\text{delta} = \frac{\partial \text{value}}{\partial S} \frac{S}{100} = e^{-dT} N(Z) \frac{S}{100} \tag{4}$$

where $Z = \left[\ln(S/X) + (r_f - d + 0.5\sigma^2)T\right] / \sigma\sqrt{T}$. $N'(\cdot)$ and $N(\cdot)$ are the normal probability density function and the cumulative normal distribution respectively. S is the closing stock price at the fiscal year end, X is the exercise price of the option, σ is the annualized standard deviation of daily stock returns (as reported in ExecuComp), r is the continuously compounded risk-free rate for a maturity value equal to that

[4] The critical view of diversification lowering bank risk is echoed by theoretical work. For instance, Wagner (2008) suggests that diversification — by lowering banks' need for outside liquidity — encourages risk-taking and, because it exposes banks to similar type risks, discourages the provision of liquidity to other institutions. Bank diversification may thus increase the likelihood of a systemic crisis.

of the option contract, d is the continuously compounded divided yield and T is the time to maturity of the option grant.

Vega is calculated in (3) as the partial derivative of the value of the bidding CEO's portfolio of options (estimated using the dividend-adjusted Black and Scholes value) with respect to changes in the annual standard deviation of equity returns. We calculate vega at the end of the fiscal year before the acquisition announcement and multiply it by .01 to attain the dollar-change in option value associated with a .01 change in the standard deviation of the bidding bank's stock return.[5] Vega is computed separately for option grants made in the announcement year and option grants made in previous years. To value previously granted options, we employ an algorithm developed by Core and Guay (2002) to approximate the average characteristics of previously-granted option contracts. Core and Guay's approximation method is widely-used in the applied compensation literature (e.g., Coles et al. 2006; Rajgopal and Shevlin, 2002; Mehran and Rosenberg, 2007).

Delta is computed in (4) as the dollar change in CEO wealth generated by a 1% increase in the stock price. Delta is the sum of the delta of option grants (for both new and previous option grants; previous option grants are valued using Core and Guay's (2002) approximation method) and the delta of stock grants. For option grants, delta is calculated as the partial derivative of the dividend-adjusted Black and Scholes value which is multiplied by 1% of the stock price. For stock grants, delta is 1% of the stock price times the number of stocks which the bidding CEO owns in the acquiring firm. Like vega, delta is computed at the end of the fiscal year before the acquisition announcement.

Both vega and delta are functions of bank size — i.e. CEOs at larger banks see their wealth increase faster as a result of both increases in risk and share prices. This makes meaningful comparisons of these incentive measures across banks difficult. We, therefore, follow Edmans et al. (2009) and Graham and Rogers (2002) and scale vega and delta by CEO cash compensation (salary plus bonus) during the fiscal

[5] Our calculation of vega does not include stock grants, because Guay (1999) demonstrates that the vega of stock holdings is zero. Fahlenbrach and Stulz (2011) argue that the zero-vega assumption for stock grants also applies to leveraged firms such as banks.

year before the merger. The scaled vegas and deltas offer a clearer indication of the magnitude of economic incentives embedded in CEO compensation contracts.[6]

Table 4 provides an overview of the pay incentive structure for acquiring CEOs in our sample. We report vega and delta (in $ thousands) as well as their values when scaled by cash compensation. Panel A shows the distribution of CEOs' pay incentives varies considerably across our sample. For instance, median vega (delta) equals $62,700 ($166,300) compared with an average of $225,800 ($733,100). Scaled by cash compensation, median vega (delta) is about 6% (17%) against an average value of 14% (44%).

[Table 4 near here]

Next, we examine the differences in CEO incentive structure before and after deregulation (GLBA) and by acquiring bank size. Our rationale for testing the effect of deregulation and bidder size is as follows. Agency explanations that focus on conflicts between risk-neutral shareholders and risk-averse management over the riskiness of a firm argue that optimal CEO compensation in banking needs to encourage bank managers to exploit many of the new opportunities which deregulation has opened up (see Smith and Watts, 1992; Mehran and Rosenberg, 2007). If CEO compensation were to induce managers to exploit the increasing investment opportunity set resulting from deregulation, we would expect to see higher CEO vegas in the period following the passing of GLBA. By contrast, CEO compensation may not be designed to induce bank CEOs to invest in risky and positive NPV projects, but, instead, to extract gains from regulators and bondholders by exploiting explicit and implicit safety net guarantees (Crawford et al, 1995). If CEO compensation were to motivate risk-shifting, we would expect the largest banks (which are most likely to enjoy implicit government guarantees) to offer more contractual risk-taking incentives to CEOs.

Table 4 reports evidence consistent with CEO incentives having increased in response to deregulation as well as to promote risk-shifting behavior. Panel B of Table 4 analyzes the argument that an increasing

[6] Next to correlating highly with bank size, vega and delta also have high correlation coefficients between them (the correlation coefficient between their log transformations is .77). This would invalidate the joint inclusion of vega and delta in a single regression model. However, scaling the incentive variables by cash compensation also avoids both of these issues (the correlation coefficient between the scaled measures of vega and delta is .52).

investment opportunity set for banks is associated with more incentive-based CEO pay by comparing the CEO compensation structure between 2000-2007 (post-GLBA) and 1993-1999 (pre-GLBA). Median CEO vegas increased from $38,800 in the pre-GLBA period to $102,900 in the post-GLBA period (difference significant at 1%). Furthermore, Panel C of Table 4 shows that the structure of CEO pay incentives also varies by bank size. We distinguish between small and large bidders based on whether bidding banks are located above or below the sample median of total assets. The results show that the largest banks in our sample offer more contractual risk-taking incentives (significant below 1%). The findings in Panel B and C also hold for CEO delta and when we scale vega and delta by CEO cash salary (significant at 1%).

We will revisit the importance of the time period under investigation and of bidding bank size in the multivariate analysis in the following section.

5 CEO Compensation and Risk-taking in Bank Acquisitions

5.1 The Model

In this section, we investigate how merger-related risk changes (ΔIADD) are affected by CEO pay incentives. Our general model can be summarized as:

$$\Delta\text{IADD}_i = \alpha_0 + \beta_1 VEGA_{i,t} + \beta_2 DELTA_{i,t} + \gamma^{'}\mathbf{DC}_i + \theta^{'}\mathbf{AC}_{i,t-1} + \delta^{'}\mathbf{GOV}_{i,t-1} + \beta_3 MACRO + \varepsilon_i \quad (5)$$

Where:

- ΔIADD_i is the merger-related change in industry-adjusted distance to default (see Section 3)
- *VEGA* is the pay-risk sensitivity of the acquiring CEO scaled by cash salary (Section 4)
- *DELTA* is the pay-performance sensitivity of the acquiring CEO over cash salary (Section 4)
- $\mathbf{DC}_i$ is a $(k \times 1)$ vector of merger characteristics
- $\mathbf{AC}_{i,t-1}$ is a $(j \times 1)$ vector of acquiring bank characteristics at the end of the quarter before the announcement of the merger
- $\mathbf{GOV}_{i,t-1}$ is a $(h \times 1)$ vector of CEO and board power proxies

- *MACRO* captures macroeconomic conditions in the U.S. state in which the bidding bank is charted in.

The vector of merger characteristics controls for deal size, the legal status of the target bank and the method of payment. We measure deal size by the ratio of deal value to the market value of the bidder (RELSIZE). RELSIZE may affect the risk profile of the acquirer in several ways. First, larger deals may produce more diversification benefits and reduce the default risk of the acquiring bank. Second, larger mergers are also more complex to integrate into the context of the bidding bank and may lead to organizationally more complex institutions (Knapp et al., 2005). In the aftermath of a deal, large mergers may, therefore, cause an increase in default risk.

We distinguish between publicly listed and private target firms via a dummy variable (LISTED). We expect bank mergers involving public targets to produce positive risk effects, because listed firms are likely to be larger and, thus more diversified than private targets. Also, the increased disclosure requirements pertaining to public firms facilitate effective due diligence by bidding banks — with positive implications for the bidder's risk assessment capabilities. The payment method is captured by the percentage of a deal which is paid for in cash (CASH). Furfine and Rosen (2009) suggest that fully cash-financed mergers are likely to increase bidder risk, because bidders are substituting safe liquid assets with the (more risky) balance sheet of the target. Echoing the univariate tests in Section 3, we use binary variables to capture if deals entail geographic diversification (intra-state versus inter-state, G_DIV) or activity diversification (based on the first two digits of the SIC code of the firms involved, P_DIV).

Moving on to the vector of acquiring bank fundamentals, we include measures of pre-merger performance, leverage and bank size which we obtain from 9-YC forms filed with the Federal Reserve System. We measure pre-merger performance by ROA (net income scaled by total assets). In addition, we include the market-to-book ratio (MTB) as a proxy for executive hubris which we expect to be negatively associated with merger-related changes in distance to default.

Given the call option properties of equity (which combines unlimited upside with limited downside potential), the benefits to shareholders associated with risk-shifting are particularly large for highly-leveraged firms such as banks (John and John, 1993). We therefore expect that higher leverage will lead to increased risk-taking in the context of bank mergers. We follow John et al. (2010) and define pre-merger LEVERAGE of the bidding bank as 1 minus the equity-to-assets ratio. Furthermore, we control for acquirer size via the log transformation of total bank assets (SIZE). Bidding bank size could yield benefits in terms of realizing economics of scale and scope and could, therefore, have a risk-reducing impact. By contrast, if the diversification benefits of bank mergers decline with bidder size, large banks face incentives to increase risk through M&A and to extract too-big-to-fail benefits from regulators.

[Table 5 near here]

To evaluate whether the risk implications of a deal explain the expected performance gains for shareholders, we include cumulative abnormal returns (CAR) for -10 to +1 days relative to the merger announcement date.[7] DeYoung et al. (2010) suggest that banks in strong economic environments are more likely to implement risk-increasing investment choices. We control for macroeconomic conditions in the acquirer's state via the Federal Reserve Bank of Philadelphia's Coincident Index (MACRO).[8]

The final vector of control variables includes CEO characteristics, as well as measures of CEO and board power and an index of the strength of external monitoring. We include AGE as the log transformation of CEO age in our model. Webb (2008) argues that older CEOs are subject to less regulatory scrutiny. This means that older CEOs could engage in more risk-taking and would suggest a negative relationship between AGE and ΔIADD.

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[7] Market model parameters are estimated using 110-day daily return observations against a value-weighted index of BHCs in CRSP starting from 120 days to 11 days before the acquisition announcement date supplied by Thomson Financial.

[8] Coincident indexes are monthly indicators of economic conditions compiled at state-level. The components are non-farm payroll employment, average hours worked in manufacturing, the unemployment rate and wage and salary disbursements (deflated by the consumer price index). To compute the coincident index for each deal, we consider the average of the monthly observations starting from two months before the announcement of the deal and ending two months after its completion.

Agency theory postulates that conflicts over the riskiness of a firm ensue because managers are risk-averse and shareholders are risk-neutral. Powerful bank boards, which monitor effectively on behalf of shareholders, should therefore be associated with increased risk-taking activities, while powerful bank CEOs who face a less shareholder-oriented board should be associated with less risk-taking (Pathan, 2009). We use three variables to capture the influence of the CEO versus the board. We use CEO TENURE as in Harford and Li (2007) and a dummy variable which is equal to 1 if the CEO also acts as chairman of the board (DUALITY) as in Pathan (2009). Furthermore, we measure CEO power using Bebchuck et al.'s (2009) CEO entrenchment index (EINDEX). The index captures six corporate governance provisions which allocate power to CEOs, while restricting the influence of shareholders.[9] In the context of our analysis, we expect a positive sign on the coefficients of each of our measures of CEO power.

In the banking industry, deposit insurance, as well as the operation of implicit government bail-out policies, discourages most bank creditors from limiting CEO risk-taking. However, monitoring by uninsured claim holders as well as by bank regulators may partly counteract this moral hazard issue. Following John et al. (2010), we construct an index of the intensity of outside monitoring (MINDEX) by three groups: regulators (regulatory scrutiny is proxied using industry-adjusted distance to default in the pre-merger period; lower industry-adjusted distance to default (i.e. higher bank risk) implies more intense monitoring by regulators as suggested by Webb (2008) and John et al. (2010)); uninsured depositors (the higher the share of uninsured deposits to total deposits, the more likely depositors are to monitor bank risk); and uninsured debt-holders (where higher values of the share of subordinated debt to total assets indicates more debt-holder monitoring).[10] To construct MINDEX, we determine the ranking of each constituent variable within

[9] The entrenchment index is the composite of the following six dummy variables (yes=1; no=0): staggered boards, limits to shareholders' by-law amendment, super-majority requirements for mergers, super-majority requirements for charter amendment, poison pills and golden parachutes. Consequently, higher values of this index indicate that CEOs are more entrenched.

[10] While neither depositors nor holders of subordinated debt have voting rights which they could use to exert direct disciplinary power on management, uninsured depositors (subordinated debt-holders) may indirectly contain the risk-taking activities of bank managers by seeking compensation for increased risk-taking through higher interest (yields) and by threatening to transfer deposits (refusing to roll over existing debt).

the sample distribution and compute the average percentile across the three variables for each bank. Higher values of MINDEX denote higher monitoring intensity by outsiders which we expect to induce a risk-reducing effect in the context of bank mergers.

Finally, we control for the pre-merger risk of the acquirer by including dummy variables that indicate which industry-adjusted DD quartile in the sample distribution an acquirer is located in during the pre-merger period (180 days to 11 days before the merger announcement date). Furfine and Rosen (2009) show that the pre-merger DD of bidding firms impacts the default risk implications of a merger. In order to conserve space, we do not report the coefficients on the DD risk dummies. An overview of our variables and summary statistics is provided in Table 5.

5.2 CEO Pay and the Default Risk Effects of Bank Mergers

Table 6 reports the results of the regressions of CEO pay incentives on the merger-related changes in industry-adjusted distance to default (ΔIADD). Since our main focus is on the relationship between risk-taking incentives and the risk implications of M&A, we first estimate a univariate regression with vega as the only explanatory variable, before adding additional control variables to the specification.

Irrespective of the regression specification employed, we observe that the coefficient on vega is negative and highly significant (below the 1% level). This indicates that CEOs whose pay is more sensitive to risk-taking engage in acquisitions that lower the distance to default (i.e. increase the default risk) of the bidding bank. As well as statistically significant, the effect of vega on increased risk-taking is economically significant. As Panel B of Table 6 reports, one-standard deviation increase in vega (the equivalent of an increase in vega from 12% to around 30%) causes a change in merger-related distance to default from -.16 to -.19 — a substantial worsening in default risk compared with the average deal in our sample (see Table 2). We conclude from this that contractual risk-taking incentives embedded in CEO compensation strongly influence the riskiness of investment choices made by bank CEOs.

[Table 6 near here]

In addition, we find a positive relationship between delta and the realized risk effects of bank mergers. High-delta CEOs are more risk averse and avoid risk-increasing acquisitions. This finding contrasts with arguments which posit that attempts to align the interests of managers and shareholders through more performance-sensitive CEO pay encourages managerial risk-taking and risk-shifting behavior (Crawford et al., 1995; John et al., 2010). The economic impact of delta is also large with a one-standard deviation increase in CEO pay-performance sensitivity causing merger-induced DD effects to increase by .10 units.

As regards the control variables, we find that geographic and product diversification produce opposite risk effects. Mergers involving banks chartered in different states generate risk reduction benefits, possibly as a result of diversification gains when business cycles across states are less then perfectly correlated. By contrast, product diversifying mergers are associated with increases in default risk in the time period following a merger. This result is consistent with a wider literature, which reports risk-increasing effects when banks diversify into non-interest related and fee-based activities. This is because innovative business lines produce revenue streams which are more volatile compared with traditional lending activities (see for example, Stiroh 2006; DeYoung and Roland, 2001).

Our models also provide some indications of a negative relationship between the market-to-book ratio (MTB) and ΔIADD. The corporate finance literature has long linked high bidder valuations to poor motivations for M&A. Examples of this are executive hubris caused by high firm valuations or market timing by CEOs who seek acquisitions in order to exploit overvaluations in their company's equity (Shleifer and Vishny, 2003). Finally, there is a link between the riskiness of acquisitions and macroeconomic conditions. Periods of economic growth (as captured by MACRO) are accompanied by higher risk-taking in the market for corporate control.

5.3 The Effects of CEO Power and External Monitoring

Table 7 extends the analysis of the pay incentives in bank M&A to include variables related to CEO power and the intensity of external monitoring of risk-taking. We seek to establish that our findings in the previous section are not driven by high-vega or high-delta banks having certain governance characteristics. For instance, the extent to which boards reflect CEO interests as opposed to shareholder interests may well have implications for the risk effects of CEO decisions (Pathan, 2009). Boards under the control of the CEO may engage less in risk-increasing deals because CEOs (in the absence of risk-taking incentives) are more risk averse than shareholders.

[Table 7 near here]

The inclusion of external monitoring variables does not modify our main finding that vega exerts a negative influence on the DD effects of bank mergers. The monitoring and CEO power variables do not enter the regressions with a statistically significant coefficient. The only exception is CEO age which enters the regression model with a negative and significant coefficient (significant below 10% in most specifications). Webb (2008) argues that older and more experienced CEOs are subject to less monitoring by regulators which is likely to stimulate risk-taking choices.[11] Overall, Table 7 suggests that measures of CEO power and external monitoring are not key drivers of the riskiness of acquisitions.

5.4 Pay Incentives and Merger-related Default Risk Pre- and Post-GLBA

Next, we test whether the effect of pay incentives on merger-related risk-taking is constant across the sampling period. The univariate tests in Section 4 (Table 2) show that federal bank deregulation as

[11] In unreported regressions, we also add board independence (the number of directors who are not executives, former executives or related to (former) executives divided by board size) to our model. The coefficient is not significant at customary levels, while the other coefficients are qualitatively very similar to those reported in Table 6. The only difference is that CEO age and the product diversification dummy do not have significant coefficients. However, we do not include board independence in our model, because of missing data for this variable, particularly in the early 1990s. While this reduces the sample size to 140, it also biases the composition of our sample towards more recent deals. This is particularly problematic as the results for more recent bank mergers vary from the rest of the sample (see Section 5.4).

facilitated by the passing of the Gramm-Leach-Bliley Act (GLBA) in 1999 has had a profound impact on the structure of management compensation. Compensation packages of acquiring banks' CEOs in the post-GLBA period boast a much larger share of equity-linked compensation than CEO pay in the pre-GLBA period. We now examine whether CEOs have been responsive to these changes in the structure of their pay. If so, CEO incentive pay should be a more important factor in explaining the risk effects of M&A after the passing of GLBA than in the period preceding this.

We test this expectation in Table 8. We distinguish between mergers which were announced before the passing of GLBA (columns 1 to 4) and afterwards (columns 5 to 8) and we re-estimate our model for both time periods. The results in Table 8 confirm that, while the incentive structure of CEO remuneration does not impact risk-taking pre-GLBA, vega and delta enter the specifications with a significant sign in the period following the deregulation of banking activities. In conjunction with the results reported in Section 4, which show that the share of equity-linked CEO compensation has increased following the deregulation of banking activities, our results show that risk-taking by CEOs has responded to post-GLBA increases in their pay incentives.[12]

[Table 8 near here]

It is also interesting to note that external monitoring has a risk-reducing impact in the pre-GLBA period. MINDEX (which captures the level of scrutiny which the risk choices by bank CEOs are exposed to from regulators as well as from holders of subordinated debt and uninsured deposits) enters with a positive and statistically significant coefficient (at the 5% level) in the pre-GLBA period only. In the post-GLBA period

[12] The adjusted R-squared of the models drops sharply in the post-GLBA period compared with the pre-GLBA period. This is mainly due to the inclusion of the pre-merger risk dummies. In unreported tests, we re-estimate the models after omitting the risk dummies and including a modified monitoring index (which no longer includes pre-merger risk as a constituent). We find that models without MINDEX have similar explanatory power in the pre- and post-GLBA period. Since MINDEX enters the remaining regression models at customary levels of statistical significance in the pre-GLBA period, pre-GLBA models including MINDEX continue to have a higher R-squared power pre-GLBA than post-GLBA. Most importantly, omitting the risk dummies from the regression and modifying MINDEX does not alter our results (although it reduces the explanatory power of many of our models).

(when incentive pay determines the merger-related changes in DD), we do not observe that external monitoring limits CEO risk-taking. This is suggestive of incentive compensation and external monitoring acting as substitutes when affecting the risk choices of bank CEOs. Perhaps the increasing prominence of CEO incentive compensation post-GLBA has meant that bank creditors have become less motivated to limit excessive risk-taking.

5.5 Pay Incentives, Bidding Bank Size and Merger-related Default Risk Changes

Finally, we examine whether the effects of managerial risk-taking incentives on the default risk implications of bank mergers vary with the size of the bidding bank. Larger banks, because they are likely to be deemed systemically important by regulators, will benefit from implicit bail-out ('too big to fail') policies in the event of institutional failure. Bank CEOs at larger banks could, therefore, engage in risk-increasing deals in order to extract for wealth for shareholders by engaging in risk-shifting (see Crawford et al., 1995; Benston et al., 1995). Consistent with this, the univariate tests in Section 4 indicate that larger banks embed more contractual risk-taking incentives (as well as performance incentives) in their compensation contracts. We now seek to establish whether bank CEOs respond to changes in the composition of equity-based compensation.

[Table 9 near here]

To test this expectation, Table 9 divides the sample into two subgroups depending on whether the median value of total assets is below or above the sample distribution. We then analyze the determinants of merger-related changes in distance to default for each of these two groups. The results offer strong support for CEOs at large banks responding to higher incentives for additional risk-taking. The coefficient on vega is negative and significant (below 1%) for large banks only. The notion that risk-shifting behavior at the largest banks in our sample motivates risk-increasing mergers is also consistent with the negative coefficient on bank leverage (significant at below the 5% level). Bank leverage improves the expected pay-off from risky investment strategies (John and John, 1993; Bebchuk and Spamann, 2009). Coupled with the moral hazard issue over risk-taking which is most pronounced at large banks, leverage should motivate the shareholders of large banks to put in place compensation practices which promote risk-increasing investments by CEOs.

6 Robustness

We conduct several tests to evaluate the robustness of our results. First, we test if our results are affected if we employ a relative measure of DD. This measure captures merger-related changes in DD as the difference between the ratios of acquiring banks' DD to DD for a benchmark of non-merging banks before and after a deal (see Amihud et al., 2002). Second, because our DD measure may be sensitive to the historical volatility of equity, we rule out that our findings are driven by the choice of the rolling window over which equity volatility is computed. We, therefore, extend the rolling window used to compute equity volatility from 90 trading days to six months. Third, we employ logistic regressions where the dependent variable is an indicator variable that equals 1 if a bank makes an acquisition which increases DD (and zero if not). Fourth, while distance to default is a relevant risk measure for our investigation, we verify that our conclusions regarding the role of pay incentives also hold if we use a common risk measure based on the volatility of the acquiring bank's stock returns. We, therefore, re-estimate the models using merger-related changes in the acquiring bank's relative total risk as in Amihud et al. (2002). Specifically, we compute the ratio of the acquiring bank's stock volatility +11 to +180 days relative to the merger completion date to the average stock volatility over the same reference period of non-merging banks domiciled in the same country. We then subtract from this risk measure an identically defined pre-merger measure which is calculated over -180 to -11 days relative to the announcement of a deal to yield a measure of changes in relative total risk which are due to M&A.

The results of these robustness tests, displayed in Panel A to Panel D of Table 10, confirm our main finding that high-vega compensation induces merger-related increases in risk. The robustness tests also confirm that this effect is driven by deals completed in the post-GLBA period and by deals completed by large bidders.[13] Overall, the evidence on the risk-reducing effect of delta is somewhat weaker in some of these tests. The coefficients on our control variables are qualitatively identical to those reported above. We do not report the values of these coefficients to conserve space.

Finally, our sample contains 93 unique acquiring bank CEOs of which 49 have completed more than a single deal during the sample period. Furthermore, 27 out of the 49 CEOs with multiple deals have experienced an increase in vega (scaled by total cash compensation) between the first and the last deal of a merger wave. In untabulated results, we test whether unobserved CEO heterogeneity across our sample and the particular incentives faced by CEOs with multiple acquisitions partly explain our results. First, we re-estimate our regression models after including a dummy which equals 1 if a CEO has been involved in more than a single deal and has seen an increase in vega between the first to the last deal of a merger wave. Second, we re-estimate the analysis for CEOs with multiple deals (which involves a total of 128 deals). The dummy variable does not enter significantly and none of these tests alters our qualitative results.

[Table 10 near here]

7 Conclusions

For a sample of 172 U.S. bank mergers, we examine how the structure of CEO compensation at acquiring banks affects the default risk implications of mergers. We show that contractual risk-taking incentives (vega) are higher following the passing of GLBA and for the largest banks in our sample. While the former suggests that bank compensation encourages CEOs to take advantage of the growing opportunity investment set which resulted from the deregulation of bank activities, the finding that vega is higher for the largest banks is somewhat concerning. The link between bank size and CEO vega suggests that executive remuneration at large banks encourages risk-shifting activities, whereby shareholders in systemically important banks encourage CEOs to undertake risk-increasing investment choices to extract wealth from regulators and bondholders.

[13] The regression results on relative total risk (Panel D) are based on a slightly modified monitoring index which includes the pre-merger relative total risk (instead of the distance to default) of the acquirer as one of its components.

Most importantly, we find that CEOs are responsive to the vega embedded in their compensation when engaging in acquisitions. Thus, higher pay-risk sensitivity causes CEOs to engage in risk-increasing deals. We interpret this as evidence of a causal relationship between executive compensation and the riskiness of CEOs' investment choices. Our results are robust to controlling for CEO pay-performance sensitivity (delta), changes in statistical methodologies, the way we compute distance to default as well as the risk measure examined.

Alongside analyzing the effects of incentive compensation on risk-taking in the context of M&A, our study is also the first to examine the default risk effects of U.S. bank mergers. Overall, our results convey a critical view of the risk-reduction potential of bank M&As. Bank mergers tend not to reduce default risk yet CEO compensation and other factors offer substantial scope for increases in the likelihood of default following a deal.

Two policy implications derive from our work. First, our results confirm the view that the incentive structure of CEO compensation has implications for financial stability. High-vega CEOs make investment choices which increase the default risk of their institution. Since financial stability considerations are one of the main rationales for regulating banking, empirical links between financial stability and CEO pay support the case for regulating CEO pay in the banking industry. Regulating executive compensation in banking could take the form of imposing limits on the amount of risk-inducing compensation. Alternatively, it could take the form of linking capital requirements or deposit insurance premiums to risk-taking incentives embedded in CEO compensation (see John et al., 2000; Bebchuk and Spamann, 2009), or of increases in the amount of deferred compensation. The latter could remedy incentives for CEOs to shift risk by turning executives into unsecured bondholders with a financial interest in the liquidation value of a firm (see Edmans and Liu, 2011).

Second, our results suggest that increased shareholder involvement in setting executive compensation, for instance by giving shareholders a vote on compensation policy ('say on pay') as championed by the Dodd-Frank Wall Street Reform and Consumer Protection Act, is unlikely to mitigate risk-taking in the banking industry. This is because bank shareholders will find it optimal to engage in risk-shifting and offer

CEOs risk-taking incentives that extract gains from other groups of bank creditors. Our results confirm this by reporting behavior which is consistent with risk-shifting at the largest banks in our sample. Consequently, using executive compensation policy to align the interests of shareholders and management in banking is likely to lead to excessive risk-taking.

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Table 1: Overview of Bank M&A Sample

Panel A: Distribution of M&A by year

	Number of Acquisitions		Number of Announcements		Total Value Acquisitions		Average Value Acquisitions
	N	%	N	%	$ mill	%	$ mill
1993	16	9.30	33	12.64	6,467.72	1.79	404.23
1994	11	6.40	25	9.58	11,535.06	3.20	1,048.64
1995	8	4.65	11	4.21	9,201.86	2.55	1,150.23
1996	10	5.81	15	5.75	4,827.98	1.34	482.80
1997	15	8.72	30	11.49	19,006.09	5.27	1,267.07
1998	12	6.98	19	7.28	6,852.20	1.90	571.02
1999	11	6.40	21	8.05	4,870.90	1.35	442.81
2000	8	4.65	10	3.83	13,973.61	3.88	1,746.70
2001	12	6.98	13	4.98	4,864.20	1.35	405.35
2002	5	2.91	6	2.30	7,670.66	2.13	1,534.13
2003	11	6.40	12	4.60	65,589.94	18.20	5,962.72
2004	14	8.14	18	6.90	89,915.44	24.94	6,422.53
2005	16	9.30	23	8.81	44,250.43	12.28	2,765.65
2006	11	6.40	12	4.60	37,030.87	10.27	3,366.44
2007	12	6.98	13	4.98	34,415.01	9.55	2,867.92
Total	172	100.00	261	100.00	360,471.99		

Panel B: Number of Deals by Acquirers

Number of Acquisitions	Number of Unique Acquirers	%
1	20	26.0
2	14	18.2
3	14	18.2
4	6	7.8
5 or more	23	29.9
Total	77	100.0

The table provides an overview of the sample of bank mergers. We consolidate 261 individual announcements into 172 bank acquisitions by stipulating that there must be at least 180 trading days between separate acquisitions and no further deals pending until 180 days following completion of a deal. If bidders make overlapping acquisition announcements within this time window, we follow Furfine and Rosen (2009) and treat these announcements as a single deal. Monetary aggregates are in constant 2007-$ terms based on the Consumer Price Index (All Urban Consumers).

Table 2: The Effects of M&A on Bidding Bank Industry-adjusted Distance to Default (ΔIADD)

	N	Mean (t-stat)	Median (z-stat)	ΔIADD>0	
				n	%
Complete Sample	172	-0.066 (-0.790)	0.058 (0.641)	90	52.3
Geographic Diversification					
Intra-state M&A	73	-0.257* (1.865)	-0.181 (-1.556)	34	46.7
Inter-state M&A	99	0.076 (0.740)	0.192 (0.834)	56	56.7
Activity Diversification					
Focusing M&A	14	-0.133 (0.144)	0.135 (0.270)	78	54.9
Product Diversifying	30	-0.314* (-1.665)	-0.486* (-1.656)	12	40.0
Time Period					
Pre Gramm-Leach-Bliley Act (1992-1999)	83	-0.023 (-0.199)	0.075 (0.856)	45	54.2
Post Gramm-Leach-Bliley Act (1999-2007)	89	-0.106 (-0.874)	0.038 (-0.661)	45	50.6
Bidder Size					
< Sample Median	86	-0.072 (-0.638)	0.049 (-0.424)	44	51.2
> Sample Median	86	-0.059 (-0.483)	0.101 (-0.291)	46	53.5

This table reports the sample mean (median) changes in Industry-adjusted Distance to Default (ΔIADD) computed for the period before the announcement of the merger and for the period after the effective date of the merger. For each bidder, distance to default before the merger is computed as the average of the distance to default over the period from -180 day to -11 days relative to the announcement, while the distance to default after the merger is computed as the average of the distance to default over the period from +11 days to +180 days after the effective date. These measures are then industry-adjusted. The change in the Industry-adjusted Distance to Default is the difference between the post-effective date and pre-announcement period IADD. *t*-Test (signrank -tests) evaluate the null hypothesis that mean (median) ΔIADD equals zero. We present merger-induced risk changes by whether a deal involves banks chartered in different states (geographic diversification), the first two-digits of the SIC code of institutions involved in a deal are identical (product diversification), whether the deal was announced before or after the passing of GLBA and bidding bank size (relative to the median of the distribution of total assets in our sample).

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3: Deal Characteristics and Bidding Bank Industry-adjusted Distance to Default (ΔIADD), by Bidding Bank Size

	Small Bidding Banks: Total Assets < Sample Median					Large Bidding Banks: Total Assets > Sample Median				
	N	Mean (t-stat)	Median (z-stat)	ΔIADD>0		N	Mean (t-stat)	Median (z-stat)	ΔIADD>0	
				n	%				n	%
Geographic Diversification										
Intra-state M&A	52	-0.170	-.0165	24	46.2	21	-0.470*	-0.181	10	47.6
		(-1.060)	(-0.902)				(-1.769)	(-1.338)		
Inter-state M&A	34	0.077	0.147	20	58.8	65	0.074	0.200	36	55.4
		(0.519)	(0.692)				(0.551)	(0.526)		
Activity Diversification										
Focusing M&A	77	-0.031	0.064	40	51.9	65	0.008	0.200	38	58.5
		(-0.266)	(-0.079)				(0.054)	(0.408)		
Product Diversifying	9	-0.426	-0.462	4	44.4	21	-0.266	-0.510	8	38.1
		(-1.022)	(-0.889)				(-1.275)	(-1.408)		
Time Period										
Pre Gramm-Leach-Bliley Act (1992-1999)	42	0.073	0.083	23	54.8	41	-0.122	0.075	22	53.7
		(0.459)	(0.544)				(-0.752)	(-0.369)		
Post Gramm-Leach-Bliley Act (1999-2007)	44	-0.212	-0.068	21	47.7	45	-0.002	0.128	24	53.3
		(-1.331)	(-1.039)				(-0.010)	(-0.040)		

This table reports the sample mean (median) changes in Industry-adjusted Distance to Default (ΔIADD) computed for the period before the announcement of the merger and for the period after the effective date of the merger. For each bidder, distance to default before the merger is computed as the average of the distance to default over the period from -180 day to -11 days relative to the announcement, while the distance to default after the merger is computed as the average of the distance to default over the period from +11 days to +180 days after the effective date. These measures are then industry-adjusted. The change in the Industry-adjusted Distance to Default is the difference between the post-effective date and pre-announcement period IADD. *t*-Test (signrank -tests) evaluate the null hypothesis that mean (median) ΔIADD equals zero. We present merger-induced risk changes by whether a deal involves banks chartered in different states (geographic diversification), the first two-digits of the SIC code of institutions involved in a deal are identical (product diversification), whether the deal was announced before or after the passing of GLBA for the group of small and larger banks (relative to the median of the distribution of total assets in our sample).
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4: Bidding CEO Incentive Structures

Panel A: Summary Statistics of CEO Incentives

	N	Mean	Median	St. Dev.	5 Pctile	95 Pctile
vega ($ 000)	172	225.8	62.7	403.3	4.6	1316.7
delta ($ 000)	172	733.1	166.3	2633.3	23.7	2104.2
vega (scaled by salary + bonus)	172	0.142	0.061	0.267	0.010	0.572
delta (scaled by salary + bonus)	172	0.441	0.171	0.839	0.041	1.913

Panel B: CEO Incentives Before and After Gramm-Leach-Bliley Act

	N	Mean	Median	N	Mean	Median	t-Test	z-Test
	Pre Gramm-Leach-Bliley Act (1993-1999)			Post Gramm-Leach-Bliley Act (2000-2007)				
	(1)	(2)	(3)	(4)	(5)	(6)	(2) – (5)	(3) – (6)
vega ($ 000)	83	87.1	38.8	89	355.1	102.9	-4.60***	-4.21***
delta ($ 000)	83	458.8	102.7	89	988.8	351.1	-1.32	-4.76***
vega (scaled by salary+ bonus)	83	0.070	0.049	89	0.209	0.093	-3.53***	-3.99***
delta (scaled by salary+ bonus)	83	0.295	0.119	89	0.577	0.218	-2.23**	-4.25***

Panel C: Differences in CEO Incentives by Bidding Bank Size

	Total Assets < Sample Median			Total Assets > Sample Median				
	(7)	(8)	(9)	(10)	(11)	(12)	(8) – (11)	(9) – (12)
vega ($ 000)	86	53.0	25.6	86	398.6	193.5	-6.21***	-7.89***
delta ($ 000)	86	167.5	92.5	86	1298.7	408.2	-2.88***	-6.68***
vega (scaled by salary+ bonus)	86	0.043	0.062	86	0.223	0.115	-4.16***	-5.89***
delta (scaled by salary+ bonus)	86	0.199	0.149	86	0.682	0.222	-3.93***	-3.12***

The table presents bidding CEO pay characteristics in the fiscal year before the acquisition announcement based on Core and Guay's (2002) methodology. Vega (=pay-risk sensitivity) is calculated as the partial derivative of the value of the bidding CEO's portfolio of options with respect to changes in the annual standard deviation of equity returns multiplied by .01 to attain the dollar-change in option value associated with a 1% change in the standard deviation of the bidding bank's stock return. Delta (=pay-performance sensitivity) is computed as the dollar change in CEO wealth generated by a 1% increase in the stock price. Delta is the sum of the delta of option grants and the delta of stock grants. For option grants, delta is calculated as the partial derivative of the dividend-adjusted Black and Scholes value which is multiplied by 1% of the stock price. For stock grants, delta is 1% of the stock price times the number of stocks which the bidding CEO owns in the acquiring firm. ***(**;*) denotes significance at 1% (5%; 10%)

Table 5: Summary Statistics of Control Variables

		Definition	N	Mean	Median	St. Dev.	5 Pctile	95 Pctile
Deal Characteristics	RELSIZE (%)	Deal value over market value of the acquirer.	172	18.83	10.54	20.37	1.71	66.42
	LISTED	Dummy variable which is equal to 1 if the target is listed (zero otherwise).	172	0.59	1.00	0.47	0.00	1.00
	CASH (%)	Percentage of a deal paid for in cash.	172	23.63	0.00	33.31	0.00	100.00
	G_DIV	Dummy which is equal to 1 if bidders and targets are chartered in different states (and zero otherwise).	172	0.58	1.00	0.48	0.00	1.00
	P_DIV	Dummy which is equal to 1 if bidders and targets do not share the first two digits of the SIC code (and zero otherwise).	172	0.18	0.00	0.37	0.00	1.00
Acquirer Characteristics	ROA (%)	Net income over total assets.	172	0.76	0.68	0.43	0.25	1.62
	MTB	Market value of equity over book value of equity.	172	2.30	2.12	0.88	1.38	3.95
	LEVERAGE (%)	1 – (equity divided by total assets).	172	91.39	91.60	1.49	88.98	93.68
	SIZE	Log of total assets.	172	16.52	16.10	1.48	14.79	19.83
	CAR (%)	Market model cumulative abnormal return between -10 days to +1 day relative to the merger announcement date.	172	-0.94	-0.78	4.29	-9.31	6.43
Macroeconomic Conditions	MACRO	Coincident index by Federal Reserve Bank of Philadelphia which summarizes macroeconomic conditions in the state of the acquiring bank.	172	134.81	136.93	21.24	101.35	165.87
Governance Variables	TENURE	Log (years since appointed as CEO).	172	1.99	2.07	0.80	0.37	3.14
	AGE	Log (CEO age).	172	4.02	4.03	0.10	3.83	4.17
	DUALITY	Dummy equal to 1 if the CEO is chairman of the board (and zero otherwise).	172	0.65	1.00	0.48	0.00	1.00
	EINDEX	Entrenchment index. This index captures six corporate governance provisions which restrict shareholder influence (yes=1; no=0): staggered boards, limits to shareholders' by-law amendment, super-majority requirements for mergers, super-majority requirements for charter amendment, poison pills and golden parachutes (*Source*: Bebchuk et al., 2009).	171	2.88	3.00	1.38	0.00	5.00
	MINDEX	External monitoring index. Average percentile rank of sample banks based on three indicators: pre-merger industry-adjusted risk, the share of insured deposits over total deposits, and subordinated debt over total assets.	164	68.95	67.83	25.62	25	112.00

This table reports summary statistics for the control variables. Bank fundamentals refer to the end of the last quarter before the merger. Continuous bidding bank variables have been winsorized at the 2% (98%) level.

Table 6: CEO Incentives and the Default Risk Effects of Bank M&A

Panel A:	**(1)**	**(2)**	**(3)**
VEGA	**-0.916****	**-1.114*****	**-0.917****
	(2.32)	**(3.04)**	**(2.48)**
DELTA		**0.137****	**0.137****
		(2.24)	**(2.13)**
RELSIZE		-0.682	-0.638
		(1.54)	(1.49)
LISTED		0.110	0.074
		(0.54)	(0.38)
CASH		-0.120	-0.022
		(0.48)	(0.09)
G_DIV		**0.248***	**0.267***
		(1.68)	**(1.93)**
P_DIV		**-0.404***	**-0.407***
		(1.84)	**(1.95)**
ROA		26.199	26.357
		(1.31)	(1.40)
MTB		**-0.203*****	**-0.130***
		(2.74)	**(1.82)**
LEVERAGE		-2.482	-6.645
		(0.60)	(1.50)
SIZE		0.087	**0.114***
		(1.43)	(1.93)
CAR		-2.615	-2.518
		(1.54)	(1.50)
MACRO			**-0.010*****
			(2.81)
Constant	0.055	1.647	6.165
	(0.61)	(0.49)	(1.65)
Risk Dummies	No	Yes	Yes
Observations	172	172	172
Adjusted R^2	0.019	0.231	0.251
Panel B: Economic Significance of CEO Incentives			
VEGA	-0.156	-0.190	-0.156
DELTA		0.101	0.101

The table shows the regression results of the impact of CEO incentives on merger-related default risk effects of M&A (ΔIADD). The default risk effect is computed as the change in the industry adjusted distance to default as described in Section 4. VEGA (DELTA) measures CEO pay-risk (-performance) sensitivity scaled by cash salary (see Section 4). RELSIZE is the deal value divided by the market value of the acquirer ten days before the announcement. LISTED is a dummy equal to 1 if the target is a listed company, CASH is the percentage of the deal paid by cash, G_DIV is a dummy equal to 1 if the acquirer and the target are chartered in different states, P_DIV is a dummy equal to 1 if acquirer and target do not share the first two digits of the SIC code, CAR are market model-adjusted cumulative abnormal returns computed from ten days before the announcement to one day after the announcement. SIZE is the log of acquirer total assets, MTB is the ratio between the market value of equity ten days before the announcement and the book value of equity. ROA is the ratio of net income and total asset, MACRO is a composite indicator of macroeconomic conditions in the state where the acquirer is chartered, computed as the simple average of the monthly observation in the period spanning from two months before the merger to two months after its completion. Accounting data refers to the last quarter before the announcement. Risk dummies indicate whether a bidding bank is located in one of the top three DD quartiles in the pre-merger period. Continuous variables are winsorized at the 2% level. Robust standard errors clustered at the level of bidding banks are reported in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 7: Default Risk Effect of M&A, CEO Power and External Monitoring

	(1)	(2)	(3)	(4)
VEGA	**-0.952****	**-0.994****	**-1.042*****	**-1.070*****
	(2.56)	**(2.63)**	**(2.78)**	**(2.80)**
DELTA	**0.152****	**0.184****	**0.125***	**0.148***
	(2.49)	**(2.52)**	**(1.74)**	**(1.83)**
RELSIZE	-0.619	-0.525	**-0.826***	-0.760
	(1.42)	(1.11)	**(1.67)**	(1.41)
LISTED	0.111	0.094	0.118	0.106
	(0.57)	(0.48)	(0.60)	(0.53)
CASH	0.038	0.060	0.031	0.046
	(0.16)	(0.26)	(0.13)	(0.19)
G_DIV	**0.326****	**0.331****	**0.393*****	**0.393*****
	(2.28)	**(2.39)**	**(2.77)**	**(2.84)**
P_DIV	**-0.387***	**-0.389***	**-0.470****	**-0.470****
	(1.82)	**(1.85)**	**(2.30)**	**(2.32)**
ROA	30.304	27.266	**31.745***	29.771
	(1.57)	(1.48)	**(1.68)**	(1.63)
MTB	**-0.148***	**-0.156***	-0.125	-0.132
	(1.93)	**(1.95)**	(1.57)	(1.59)
LEVERAGE	-7.287	-7.108	-7.373	-7.236
	(1.54)	(1.51)	(1.46)	(1.44)
SIZE	**0.123***	**0.134****	**0.146****	**0.153****
	(1.82)	**(2.00)**	**(2.15)**	**(2.25)**
CAR	-2.808	-2.509	**-3.651***	**-3.445***
	(1.55)	(1.35)	**(1.95)**	**(1.81)**
MACRO	**-0.010*****	**-0.010*****	**-0.012*****	**-0.012*****
	(2.91)	**(2.94)**	**(2.98)**	**(2.98)**
TENURE	0.075	0.074	0.161	0.158
	(0.82)	(0.81)	(1.55)	(1.52)
AGE	**-1.315***	**-1.239***	**-1.666****	**-1.602****
	(1.99)	**(1.92)**	**(2.44)**	**(2.33)**
DUALITY	0.052	0.065	-0.055	-0.041
	(0.30)	(0.36)	(0.29)	(0.21)
EINDEX		0.054		0.037
		(0.98)		(0.66)
MINDEX			0.004	0.004
			(0.98)	(0.94)
Constant	11.761**	10.957**	12.461**	11.877**
	(2.40)	(2.15)	(2.39)	(2.18)
Risk Dummies	Yes	Yes	Yes	Yes
Observations	172	171	164	163
Adjusted R^2	0.251	0.247	0.258	0.250

The table shows the regression results of the impact of CEO incentives on merger-related default risk effects of M&A (ΔIADD). The default risk effect is computed as the change in the industry adjusted distance to default as described in Section 4. VEGA (DELTA) measures CEO pay-risk (-performance) sensitivity scaled by cash salary (see Section 4). RELSIZE is the deal value divided by the market value of the acquirer ten days before the announcement. LISTED is a dummy equal to 1 if the target is a listed company, CASH is the percentage of the deal paid by cash, G_DIV is a dummy equal to 1 if the acquirer and the target are chartered in different states, P_DIV is a dummy equal to 1 if acquirer and target do not share the first two digits of the SIC code, CAR are market model-adjusted cumulative abnormal returns computed from ten days before the announcement to one day after the announcement. SIZE is the log of acquirer total assets, MTB is the ratio between the market value of equity ten days before the announcement and the book value of equity. ROA is the ratio of net income and total asset, MACRO is a composite indicator of macroeconomic conditions in the state where the acquirer is chartered, computed as the simple average of the monthly observation in the period spanning from two months before the merger to two months after its completion. All accounting items refer to the last quarter before the announcement. TENURE is the log of years since the CEO has been appointed, AGE is the log of CEO age at the end of the fiscal year before the announcement, DUALITY is a dummy equal to 1 if the CEO also acts as chairman, EINDEX is an entrenchment index from Bebchuck et al. (2009) which captures six corporate governance provisions that restrict shareholder influence, MINDEX is the average percentile rank of bidding banks on the basis of pre-merger industry-adjusted risk, the share of insured deposits over total deposits, and subordinated debt over total assets. Risk dummies indicate whether a bidding bank is located in one of the top three DD quartiles in the pre-merger period. Continuous variables are winsorized at the 2% level. Robust standard errors clustered at the level of bidding banks are reported in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 8: CEO Incentives and the Default Risk Effects of Bank M&A Before and After Deregulation

	Pre Gramm-Leach-Bliley Act (1993-1999)				Post Gramm-Leach-Bliley Act (2000-2007)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VEGA	-0.920	-1.033	-2.091	-2.184	**-1.418*** **	**-1.425*** **	**-1.412*** **	**-1.420*** **
	(0.51)	(0.55)	(1.12)	(1.10)	**(3.37)**	**(3.47)**	**(3.39)**	**(3.48)**
DELTA	0.171	0.230	0.145	0.185	**0.230** **	**0.236** **	**0.230** **	**0.237** **
	(1.32)	(1.40)	(1.00)	(1.04)	**(2.18)**	**(2.26)**	**(2.15)**	**(2.24)**
RELSIZE	-0.273	-0.142	-0.323	-0.253	-0.954	-0.934	-0.946	-0.925
	(0.58)	(0.29)	(0.52)	(0.36)	(1.14)	(1.08)	(1.14)	(1.08)
LISTED	-0.053	-0.055	-0.052	-0.052	0.355	0.348	0.339	0.331
	(0.26)	(0.27)	(0.25)	(0.24)	(1.31)	(1.26)	(1.22)	(1.18)
CASH	0.110	0.132	-0.046	-0.036	-0.124	-0.115	-0.127	-0.118
	(0.31)	(0.36)	(0.13)	(0.10)	(0.38)	(0.35)	(0.39)	(0.36)
G_DIV	0.051	0.081	0.021	0.023	**0.577** **	**0.574** **	**0.569** **	**0.566** **
	(0.25)	(0.38)	(0.10)	(0.11)	**(2.67)**	**(2.65)**	**(2.61)**	**(2.60)**
P_DIV	0.298	0.285	0.019	0.023	**-0.655***	**-0.653***	**-0.656***	**-0.654***
	(1.35)	(1.22)	(0.07)	(0.08)	**(1.87)**	**(1.88)**	**(1.86)**	**(1.86)**
ROA	3.532	-3.191	-4.041	-7.383	**47.880***	**47.355***	**47.998***	**47.450***
	(0.12)	(0.11)	(0.16)	(0.30)	**(1.79)**	**(1.82)**	**(1.80)**	**(1.82)**
MTB	-0.118	-0.139	-0.069	-0.091	**-0.157***	**-0.160***	**-0.159***	**-0.163***
	(0.73)	(0.75)	(0.45)	(0.51)	**(1.76)**	**(1.70)**	**(1.81)**	**(1.77)**
LEVERAGE	10.511	10.459	7.540	7.453	-8.320	-8.331	-8.503	-8.520
	(1.38)	(1.33)	(0.86)	(0.83)	(1.27)	(1.26)	(1.25)	(1.25)
SIZE	-0.211	-0.197	-0.134	-0.120	0.124	0.127	0.128	0.132
	(1.48)	(1.25)	(0.93)	(0.73)	(1.47)	(1.46)	(1.43)	(1.44)
CAR	**-5.014** **	**-4.927** **	**-6.109*** **	**-6.091** **	-0.953	-0.861	-0.956	-0.859
	(2.56)	**(2.47)**	**(2.74)**	**(2.65)**	(0.34)	(0.29)	(0.33)	(0.29)
MACRO	-0.006	-0.004	-0.009	-0.008	-0.015	-0.015	-0.015	-0.015
	(0.46)	(0.31)	(0.75)	(0.62)	(1.62)	(1.61)	(1.60)	(1.60)
TENURE	0.156	0.151	**0.353*** **	**0.351*** **	-0.143	-0.140	-0.143	-0.140
	(1.46)	(1.43)	**(3.37)**	**(3.21)**	(0.73)	(0.69)	(0.72)	(0.69)
AGE	-1.778	-1.717	**-2.033***	**-2.033***	-1.331	-1.310	-1.347	-1.325
	(1.57)	(1.54)	(1.93)	(1.89)	(1.67)	(1.55)	(1.64)	(1.52)
DUALITY	**0.379***	**0.377***	0.163	0.181	0.209	0.210	0.218	0.220
	(1.75)	**(1.74)**	(0.72)	(0.77)	(0.75)	(0.75)	(0.79)	(0.79)
EINDEX		0.062		0.044		0.015		0.015
		(0.98)		(0.63)		(0.17)		(0.18)
MINDEX			**0.015** **	**0.015** **			-0.001	-0.001
			(2.33)	**(2.38)**			(0.19)	(0.19)
Constant	2.023	1.259	3.470	3.095	**13.640***	13.479	**13.938***	13.779
	(0.33)	(0.21)	(0.55)	(0.48)	**(1.78)**	(1.68)	**(1.70)**	(1.61)
Risk Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	83	82	75	74	89	89	89	89
Adjusted R^2	0.460	0.455	0.514	0.499	0.168	0.157	0.157	0.144

The table shows the regression results of the impact of CEO incentives on merger-related default risk effects of M&A (ΔIADD). The default risk effect is computed as the change in the industry adjusted distance to default as described in Section 4. VEGA (DELTA) measures CEO pay-risk (-performance) sensitivity scaled by cash salary (see Section 4). RELSIZE is the deal value divided by the market value of the acquirer ten days before the announcement. LISTED is a dummy equal to 1 if the target is a listed company, CASH is the percentage of the deal paid by cash, G_DIV is a dummy equal to 1 if the acquirer and the target are chartered in different states, P_DIV is a dummy equal to 1 if acquirer and target do not share the first two digits of the SIC code, CAR are market model-adjusted cumulative abnormal returns computed from ten days before the announcement to one day after the announcement. SIZE is the log of acquirer total assets, MTB is the ratio between the market value of equity ten days before the announcement and the book value of equity. ROA is the ratio of net income and total asset, MACRO is a composite indicator of macroeconomic conditions in the state where the acquirer is chartered, computed as the simple average of the monthly observation in the period spanning from two months before the merger to two months after its completion. All accounting items refer to the last quarter before the announcement. TENURE is the log of years since the CEO has been appointed, AGE is the log of CEO age at the end of the fiscal year before the announcement, DUALITY is a dummy equal to 1 if the CEO also acts as chairman, EINDEX is an entrenchment index from Bebchuck et al. (2009) which captures six corporate governance provisions that restrict shareholder influence, MINDEX is the average percentile rank of bidding banks on the basis of pre-merger industry-adjusted risk, the share of insured deposits over total deposits, and subordinated debt over total assets. Risk dummies indicate whether a bidding bank is located in one of the top three DD quartiles in the pre-merger period. Continuous variables are winsorized at the 2% level. Robust standard errors clustered at the level of bidding banks are reported in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 9: CEO Pay and the Default Risk Effects of M&A By Bidding Bank Size

	Bidding Bank Assets < Sample Median				**Bidding Bank Assets > Sample Median**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VEGA	0.350	0.192	0.300	0.174	**-1.687*****	**-1.654*****	**-1.731*****	**-1.692*****
	(0.27)	(0.15)	(0.24)	(0.14)	**(3.76)**	**(3.79)**	**(3.86)**	**(3.84)**
DELTA	-0.159	-0.012	-0.388	-0.262	0.146	0.116	0.143	0.105
	(0.29)	(0.02)	(0.66)	(0.45)	(1.22)	(0.88)	(1.16)	(0.79)
RELSIZE	-0.236	-0.199	-0.348	-0.304	-0.391	-0.459	-0.485	-0.565
	(0.55)	(0.43)	(0.65)	(0.50)	(0.50)	(0.52)	(0.61)	(0.63)
LISTED	0.169	0.177	0.197	0.205	-0.035	-0.014	-0.040	-0.015
	(0.53)	(0.55)	(0.57)	(0.57)	(0.13)	(0.05)	(0.14)	(0.05)
CASH	**-0.468***	**-0.478***	-0.446	-0.460	0.337	0.329	0.328	0.321
	(1.92)	**(1.96)**	(1.61)	(1.66)	(0.84)	(0.82)	(0.79)	(0.78)
G_DIV	0.163	0.203	0.250	0.282	0.412	**0.432***	0.378	0.398
	(1.07)	(1.23)	(1.66)	(1.64)	(1.67)	**(1.88)**	(1.50)	(1.63)
P_DIV	-0.702	**-0.719***	**-0.750***	**-0.765***	-0.342	-0.337	**-0.417***	**-0.415***
	(1.64)	**(1.71)**	**(1.77)**	**(1.81)**	(1.57)	(1.54)	**(1.86)**	**(1.82)**
ROA	**83.108*****	**79.758*****	**80.900****	**78.294****	5.061	5.184	2.135	1.785
	(2.97)	**(2.84)**	**(2.59)**	**(2.47)**	(0.16)	(0.16)	(0.07)	(0.06)
MTB	-0.125	-0.128	-0.055	-0.060	-0.143	-0.131	-0.135	-0.119
	(0.65)	(0.65)	(0.27)	(0.29)	(1.43)	(1.24)	(1.30)	(1.08)
LEVERAGE	8.984	9.243	6.277	6.583	**-24.092****	**-24.086****	**-23.619****	**-23.662****
	(1.25)	(1.27)	(0.79)	(0.83)	**(2.54)**	**(2.49)**	**(2.48)**	**(2.41)**
SIZE	0.076	0.072	0.087	0.078	0.088	0.067	0.101	0.075
	(0.38)	(0.36)	(0.40)	(0.36)	(0.82)	(0.61)	(0.92)	(0.67)
CAR	**-6.089****	**-5.814***	**-6.607***	**-6.329***	-0.301	-0.457	-0.710	-0.901
	(2.02)	**(1.94)**	**(1.97)**	**(1.87)**	(0.13)	(0.19)	(0.29)	(0.37)
MACRO	**-0.017*****	**-0.016*****	**-0.018*****	**-0.018*****	-0.003	-0.002	-0.005	-0.004
	(3.37)	**(3.30)**	**(3.51)**	**(3.48)**	(0.44)	(0.36)	(0.66)	(0.58)
TENURE	**0.295****	**0.302****	**0.405****	**0.409***	0.048	0.062	0.081	0.099
	(2.06)	**(2.05)**	**(2.03)**	**(1.98)**	(0.36)	(0.44)	(0.59)	(0.70)
AGE	0.121	0.128	-0.172	-0.136	-1.970	-2.008	-2.037	-2.084
	(0.17)	(0.18)	(0.22)	(0.17)	(1.37)	(1.41)	(1.41)	(1.46)
DUALITY	**0.481****	**0.485****	0.293	0.303	-0.222	-0.259	-0.239	-0.284
	(2.17)	**(2.21)**	(1.03)	(1.08)	(0.66)	(0.72)	(0.70)	(0.78)
EINDEX		0.047		0.040		-0.039		-0.047
		(0.66)		(0.49)		(0.36)		(0.45)
MINDEX			0.008	0.008			0.005	0.005
			(1.55)	(1.53)			(0.67)	(0.77)
Constant	-8.013	-8.446	-5.349	-5.821	30.176***	30.691***	29.674***	30.335***
	(1.04)	(1.09)	(0.64)	(0.69)	(3.26)	(3.23)	(3.21)	(3.19)
Risk dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	86	85	80	79	86	86	84	84
Adjusted R^2	0.313	0.298	0.289	0.270	0.333	0.325	0.319	0.311

The table shows the regression results of the impact of CEO incentives on merger-related default risk effects of M&A (ΔIADD). The default risk effect is computed as the change in the industry adjusted distance to default as described in Section 4. VEGA (DELTA) measures CEO pay-risk (-performance) sensitivity scaled by cash salary (see Section 4). RELSIZE is the deal value divided by the market value of the acquirer ten days before the announcement. LISTED is a dummy equal to 1 if the target is a listed company, CASH is the percentage of the deal paid by cash, G_DIV is a dummy equal to 1 if the acquirer and the target are chartered in different states, P_DIV is a dummy equal to 1 if acquirer and target do not share the first two digits of the SIC code, CAR are market model-adjusted cumulative abnormal returns computed from ten days before the announcement to one day after the announcement. SIZE is the log of acquirer total assets, MTB is the ratio between the market value of equity ten days before the announcement and the book value of equity. ROA is the ratio of net income and total asset, MACRO is a composite indicator of macroeconomic conditions in the state where the acquirer is chartered, computed as the simple average of the monthly observation in the period spanning from two months before the merger to two months after its completion. All accounting items refer to the last quarter before the announcement. TENURE is the log of years since the CEO has been appointed, AGE is the log of CEO age at the end of the fiscal year before the announcement, DUALITY is a dummy equal to 1 if the CEO also acts as chairman, EINDEX is an entrenchment index from Bebchuck et al. (2009) which captures six corporate governance provisions that restrict shareholder influence, MINDEX is the average percentile rank of bidding banks on the basis of pre-merger industry-adjusted risk, the share of insured deposits over total deposits, and subordinated debt over total assets. Risk dummies indicate whether a bidding bank is located in one of the top three DD quartiles in the pre-merger period. Continuous variables are winsorized at the 2% level. Robust standard errors clustered at the level of bidding banks are reported in parentheses.* significant at 10%; ** significant at 5%; *** significant at 1%

Table 10: Robustness Tests

	Full Sample		Gramm-Leach-Bliley Act				Bidder Size			
			Pre-GLBA (1993-1999)		Post-GLBA (2000-2007)		Total Assets < Sample Median		Total Assets > Sample Median	
Panel A: Relative Measure of ΔIADD										
VEGA	**-0.282****	**-0.319*****	-0.237	-0.608	**-0.385*****	**-0.402*****	0.027	-0.170	**-0.476*****	**-0.471*****
	(2.59)	**(2.75)**	(0.55)	(1.29)	**(3.01)**	**(3.75)**	(0.12)	(0.71)	**(4.32)**	**(4.11)**
DELTA	**0.042*****	**0.043****	0.050	0.056	**0.047****	**0.066****	0.062	0.089	**0.037****	0.026
	(2.92)	**(2.35)**	(1.42)	(1.23)	**(2.06)**	**(2.54)**	(0.54)	(0.66)	**(2.68)**	(0.87)
Deal & Bank Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Governance Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Obs	172	163	83	74	89	89	86	79	86	84
Adjusted R^2	0.273	0.280	0.383	0.458	0.185	0.168	0.282	0.287	0.324	0.310
Panel B: DD Estimations using σ_E Calculated over Six Months										
VEGA	**-0.785****	**-0.965****	-0.735	-2.439	**-1.184****	**-1.237*****	0.196	0.203	**-1.616*****	**-1.627*****
	(2.14)	**(2.61)**	(0.42)	(1.26)	**(2.59)**	**(3.25)**	(0.17)	(0.14)	**(4.27)**	**(4.12)**
DELTA	**0.168****	**0.182****	0.169	0.187	0.144	**0.238***	-0.073	-0.443	**0.130***	0.118
	(2.33)	**(2.40)**	(1.26)	(1.00)	(1.20)	**(1.92)**	(0.18)	(0.85)	**(1.72)**	(0.88)
Deal & Bank Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Governance Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Obs	172	163	83	74	89	89	86	79	86	84
Adjusted R^2	0.249	0.252	0.403	0.456	0.195	0.175	0.301	0.291	0.289	0.294
Panel C: Logistic Regressions										
VEGA	**-3.390*****	**-3.497*****	-5.382	-11.283	**-4.663*****	**-6.473*****	2.443	1.231	**-7.429*****	**-6.832*****
	(2.60)	**(2.65)**	(0.48)	(0.90)	**(2.90)**	**(3.84)**	(0.66)	(0.35)	**(4.19)**	**(3.12)**
DELTA	0.030	0.065	0.675	0.273	0.167	**0.868*****	-0.443	-1.161	-0.217	-0.638
	(0.12)	(0.27)	(0.75)	(0.33)	(0.60)	**(2.73)**	(0.21)	(0.38)	(0.61)	(1.15)
Deal & Bank Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Governance Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Obs	172	163	83	74	89	89	86	79	86	84
Pseudo R^2	0.261	0.272	0.497	0.528	0.243	0.319	0.279	0.397	0.463	0.511
Panel D: Relative Total Risk										
VEGA	**0.271***	**0.306***	0.402	0.628	0.294	**0.311***	-0.048	0.056	**0.528*****	**0.545*****
	(1.88)	**(1.87)**	(0.77)	(1.18)	(1.64)	**(1.79)**	(0.13)	(0.12)	**(3.46)**	**(3.38)**
DELTA	**-0.068*****	**-0.073****	-0.066	-0.058	**-0.092*****	**-0.118*****	-0.104	-0.100	**-0.062****	-0.075
	(3.02)	**(2.43)**	(1.34)	(0.98)	**(2.95)**	**(2.75)**	(0.71)	(0.51)	**(2.39)**	(1.51)
Deal & Bank Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Governance Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Obs	172	163	83	74	89	89	86	79	86	84
Adjusted R^2	0.273	0.283	0.404	0.461	0.223	0.199	0.257	0.307	0.346	0.324

Table 11 (*continued*)

The table shows the regression results of the impact of CEO incentives on merger-related default risk effects of M&A (ΔIADD). The default risk effect is computed as the change in the industry adjusted distance to default scaled by cash salary (see Section 4). VEGA (DELTA) measures CEO pay-risk (-performance) sensitivity as described in Section 5. Panel A calculates ΔIADD in relative form as the DD difference between the ratios of acquiring banks' DD to DD for a benchmark of non-merging banks before and after a deal as in Amihud et al. (2002). Panel B extends the rolling window used to compute equity volatility from 90 trading days to six months. Panel C uses logistic regressions where the dependent variable is an indicator variable that equals 1 if a bank makes an acquisition which increases DD (and zero if not). Panel D re-estimates the models using merger-related changes in the acquiring bank's volatility (total risk) relative to non-merging banks in the same country as in Amihud et al. (2002).

* significant at 10%; ** significant at 5%; *** significant at 1%

Appendix: Distance to Default Calculations

The computation of DD$_t$ requires estimates of $V_{A,t}$ and $\sigma_{A,t}$ neither of which are directly observable. Following Akhigbe et al. (2007), Vassalou and Xing (2004) and Hillegeist et al. (2004), we infer the values for $V_{A,t}$ and $\sigma_{A,t}$ through an iterative process based on the Black-Scholes-Merton pricing model. Specifically, we express the market value of a firm's equity ($V_{E,t}$) as a function of the asset value by solving the following system of nonlinear equations:

$$V_{E,t} = V_{A,t} N(d_{1,t}) - L_t e^{-rT} N(d_{2,t}) \tag{A.1}$$

$$\sigma_{E,t} = \left(\frac{V_{A,t}}{V_{E,t}}\right) N\left(d_{1,t}\right) \sigma_{A,t} \tag{A.2}$$

Equation (A.1) defines $V_{E,t}$ as a call option on the market value of the bidder's total assets, with $d_{1,t} = \frac{\ln\left(V_{A,t}/L_t\right) + \left(r + 0.5\sigma_{A,t}^2\right)T}{\sigma_{A,t}\sqrt{T}}$ and $d_{2,t} = d_{1,t} - \sigma_{A,t}\sqrt{T}$. Equation (A.2) is the optimal hedge equation that relates the standard deviation of a bidder's equity value to the standard deviation of the value of total assets (both on an annualized basis).

To solve this system of equations, we employ as starting values for $\sigma_{A,t}$ the historical volatility of equity (computed daily on the basis of a 90 trading day rolling window) multiplied by the ratio of the market value of equity to the sum of the market value of equity and the book value of total liabilities, i.e. $\sigma_{A,t} = \sigma_{E,t} V_{E,t} \big/ \left(V_{E,t} + L_t\right)$. A Newton search algorithm identifies the daily values for $V_{A,t}$ and $\sigma_{A,t}$ in an iterative process which we then employ to compute DD$_t$ as in (1).