The ICFR-FT Research Prize 2010

Executive Compensation and Risk Taking

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The financial crisis has drawn renewed attention to the issue of incentives in the financial industry. Have traders, loan officers, risk managers or bank CEOs and directors had inadequate financial incentives to identify and reduce their exposure to risk? Have they been excessively rewarded for luck when times were good, and have their financial incentives been structured so that they could avoid exposure to their firm's losses when times were bad? The basis for stock-based compensation and the remuneration of CEOs through stock-options is the idea that the stock price is an objective measure of the CEO's performance, and that the CEO's objectives can be aligned with shareholders' by giving CEOs "skin in the game" through stock-price sensitive pay. As much as this justification for stock-based compensation may apply to non-financial firms with low leverage, it is not appropriate for banks and other financial institutions for two fundamental reasons. First, banks are highly levered institutions, with leverage ratios that often exceed 90%. Second, banks are regulated entities that can rely on both explicit and implicit guarantees on their debt.

For both these reasons we should expect bank CEOs and their shareholders to favor excessive risk-taking. Indeed, owners of common stock in a highly levered institution that consequently faces a significant risk of going bankrupt effectively own a call option that is in-the-money when the bank is solvent and out-of-the money when it goes bust. As is well known, the value of a call option is increasing in the volatility of the underlying stock price. This is why other things equal, shareholders in highly levered institutions generally favor excessive risk-taking, especially when the bank approaches financial distress. Of course, if bank bondholders and other creditors anticipate the greater risks being taken by the bank this ought to be reflected in the cost of debt, so that shareholders could well lose in the end from the greater risk exposure by paying a high cost of debt. This is why shareholders of highly levered institutions would benefit by being able to commit not to take excessive risks.

However, such commitments are difficult to make and enforce in practice, as a bank's risk-exposure at any moment in time is not easy to observe. The Federal Reserve's *stress test* conducted in the spring of 2009 has amply demonstrated investors' lack of knowledge of banks' exposures to various risky asset classes. Moreover, given the implicit and explicit guarantees on bank debt, excess risk-taking may not be fully reflected in the price of bank debt, so that even if bank shareholders could commit not to take excessive risk they may not want to.

To redress this problem of excess risk-taking incentives in highly levered financial institutions we propose tying CEO remuneration to the bank's CDS spread, which provides a market measure of the risks the bank is exposed to. A high, and increasing, CDS spread would then translate into a lower

cash bonus, and vice versa. Alternatively, for those banks that do not have a liquid CDS market, the cash bonus could also be tied to the firm's borrowing cost such as the debt spread. However, the CDS spread is the closest analogue to the stock price – it is a market price of credit risk. By tying CEO deferred compensation directly to the bank's own CDS spread, bank executives would have a direct financial exposure to the bank's underlying risk and could thus be induced to reduce risk that is not enterprise-value enhancing.

To underscore the likely effects of linking compensation to CDS spreads on risk-taking incentives, we examine empirical evidence that increased CEO financial exposure to underlying bank risk does indeed reduce risk-taking and is reflected in lower CDS spreads (the details of the analysis are placed in the appendix for expositional reasons) . We exploit greater disclosure requirements by the S.E.C. for CEO pay in 2007 with respect to both deferred compensation and executive pension grants to compute the fraction of CEO pay that is at risk if the bank fails. That is, we calculate the fraction of the executive's pay that is at risk in the event of a bankruptcy that may occur before the deferred compensation and pension payments are due. We find that the higher is this fraction the more the bank's CDS spread decreases. For example, we find firms with higher than median investment in deferred compensation experience 2.6% larger reduction in their CDS spreads net of market movements relative to firms below the median investment. Thus, as expected, the market believes that CEOs that stand to lose more financially in the event of the bank's failure take lower risks.

Concretely, how should bank CEO compensation be tied to CDS spreads in practice? At a minimum, bank regulators could simply recommend that bank compensation committees study ways in which compensation could be tied to the bank's CDS spread. The simplest way may be to require that CEOs write a given amount of CDS (or buy swaps written by other insurers) for the duration of their employment contract. Alternatively and more efficiently, using money set aside by the bank, their deferred bonuses may be reduced under a pre-specified formula as the bank's CDS spread deviates from the average bank spread: bonuses would be increased if the spread is below average and increased if it is above average. Another direction could be to include a CDS exposure requirement as a bond covenant and to link the presence of such an exposure to the credit rating of the bank. Finally, to the extent that shareholders also benefit from such a commitment to reduced risk-taking they may pressure the compensation committee to introduce CDS spread exposure into the CEO compensation contract.

One side-benefit of this approach is that it creates a built-in stabilizer using compensation. When banks are performing well and their credit quality is strong, bonuses will be paid out. However, when their performance deteriorates and their credit quality weakens (and they experience an increase in

their CDS spread), the banks will be forced to conserve capital through the automatic adjustment of bonuses. Our approach is thus in a sense is analogous to cutting dividends to protect the bank and its creditors. While cutting dividends imposes a cost on equity holders, our approach imposes a cost on risk-takers.

A potential argument against tying bonuses to CDS spreads is that CDS spreads were not responsive to the deterioration of bank capital during the crisis. For example, the average market value of equity to assets of 18 large institutions that participated in the U.S. SCAP program started to decline in Q4 2006 but the CDS spreads (on average) only began to react in Q2 2007. However, there are two reasons why this argument is flawed. First, the CDS market did not react initially partly due to the fact that banks seemed to have a large amount of equity capital that was above their regulatory requirements. Second, our approach effectively makes bonus payments contingent on ex-post performance. For example, the oversized bonus payments by major financial institutions for the year 2008 and 2009 were questioned by all stake-holders except their employees. Public pressure forced banks to forgo paying a large fraction of their contractual bonuses. Meanwhile, in the period from Q2 2007 to Q2 2008, the eighteen firm average CDS spread increased from about 20 to 280 basis points, and to 308 at the end of Q1 2009. Using our approach of tying bonuses to the CDS spread surely could have prevented the firms from initiating bonus payouts (without regulatory intervention or public pressure).

We focus on the use of CDS spreads as the tool to moderate risk taking incentives. We specifically use CDS based compensation because it is market based and can be chosen optimally. Several other methods of compensation have been proposed that rely on other debt-like instruments. We view theses as helpful but subject to practical problems of implementation. First, making actual debt a part of executives' compensation packages has the issue that debt is traded (and therefore priced) infrequently and exposes the executive to interest rate risk. Second, increasing deferred compensation and pension benefits is a blunt instrument since its size may not be optimally determined. Third, clawbacks may not be based on robust measures of risk taking, especially since the amount clawed back may be determined by bank examiners.

Appendix: Empirical Analysis

We collected deferred compensation and pensions as well as equity compensation in banks from proxy filings in EDGAR. CEO pension benefits may sometimes be negotiated, but they usually accrue to managers under company-wide formulas established by each company. Deferred compensation is generally paid out to the executive at retirement. We collected additional data from COMPUSTAT and CRSP for calculating the Black-Scholes stock option values as well as the value of CEO equity holdings. Lastly, we required banks in our sample to have CDS quotes data from Markit, our data source for daily CDS spreads. In particular, to enter the final sample, a bank must have CDS daily quotes on the disclosure day (event day 0) and the subsequent trading day (event day 1). Overall, this sampling procedure gives us 27 banks for our final sample.

Methodology

We follow the methodology outlined by Wei and Yermack (2010) to produce a CDS event study of the first-time disclosure of deferred compensation and pensions in banks. In a standard event study, security returns (equity or bond) are analyzed to estimate the unexpected component (abnormal return) in the returns within a window surrounding the event. The abnormal return (AR) on the event day is calculated by adjusting the return to exclude changes due to market movement. Both AR and the cumulative abnormal return (CAR) through several days surrounding the event provide an assessment of the event's impact on the security value. In the CDS market, however, spread is the main valuation metric. To follow the standard approach as closely as possible, we use daily percentage changes of CDS spread in the event analysis. Specifically, the daily "spread" return (SR) for firm i on day t, is calculated as

$$SR(i,t)=(([Spread(i,t)-Spread(i,t-1)])/(Spread(i,t-1)))$$

To control for the market movement, we next define the market "spread" return (SR_{m}) as the equally weighted average of daily CDS spreads for all financial firms

$$SR\_\{m\}(t)=((\sum\_\{i=1\}^{n}SR(i,t))/n)$$

To calculate daily abnormal "spread" returns (ASR), we follow the Market Adjusted Model approach by deducting the CDS market spread return from the individual CDS spread return on each day t.

$$ASR(i,t)=SR(i,t)-SR\_\{m\}(t)$$

Another widely used approach to abnormal return calculation employs two-stage estimation, where the market beta of each security is first estimated in a pre-event "estimation window". The

estimated market model of each security is applied to calculating the expected return of the security in the event window. In our approach, the Market Adjusted Model approach is essentially a reduced-form two-stage estimation, omitting the first-stage beta estimation by assuming all beta's equal to 1.

Lastly, the cumulated abnormal "spread" return (CASR) between event day 0 and day 1 is calculated as the sum of ASR on event day 0 and 1. CASR is the key measure used in the cross-section analysis as reported in Table 2.

$$CASR(i)=ASR(i,0)+ASR(i,1)$$

Table 1 presents CEO total wealth, which is the sum of the value of stock holdings, options and restricted stock holdings, pensions, and deferred compensation. On average, a bank CEO's wealth is about $287 million (median of $95 million). The average value of CEO equity holdings is about $265 million (median of $61 million). Bank CEOs have nearly $10 million in pensions and another $10 million in deferred compensation (with medians of nearly $5 million and $6 million in deferred bay and pensions, respectively). The percentage of CEOs' total wealth in deferred pay and pensions is about 7 and 11, respectively. On average, the ratio of a bank CEOs' sum of deferred compensation and pensions to their equity holdings is 26% (median of 29%), with the ratio of deferred pay to equity holdings of 10% (median of 7%) and pension to equity holdings of 16% (median of 14%).

Ratios of deferred pay and pensions to total wealth or equity holdings are critical in our analysis. We expect more CEO conservatism the higher these ratios are. Wei and Yermack (2010) define inside debt as the ratio of the sum of deferred compensation and pensions to CEO total wealth. They argue that both deferred pay and pensions are unsecured in the event of default. As a result, CEOs with high holdings in deferred pay and pensions are unlikely to undertake risky investment choices. If available, the information on both deferred pay and pensions can prove helpful to credit market analysts. Firms were first required to disclose this information in their proxy filings in the beginning of 2007. Therefore, we anticipate that the credit market reacted to the news in proxy filings since 2007.

We follow Wei and Yermack's approach, but we focus on banks instead of industrial firms. We estimate announcement credit market CDS spreads over the window of (0,1) for the 27 banks with CDS. The announcement returns by themselves are not very informative as proxy fillings contain other information as well. We perform a cross-sectional test of the returns and the results are reported in Table 2. It should be noted that in our OLS estimates, we do not control for firm-specific characteristics. The main reason is that we have only 27 banks and consequently small degrees of freedom in our analysis. However, this may not be highly critical for the following reasons. First, we

are using a highly homogeneous industry. All the banks are very large. Furthermore, the average (median) book debt to assets ratio in these large banks is about 92%. Also, these banks arguably face similar investment opportunity sets, and as Smith and Watts (1992) have pointed out, the investment opportunity set drives other corporate polices.

We estimate four models which are presented in Table 2. In model (1), we estimate the effect of the ratio of the sum of deferred pay and pensions to equity holdings on CDS cumulative abnormal returns. The coefficient is negative and significant, suggesting that firms with a higher investment in deferred compensation and pensions experience a larger reduction in their credit spreads. In model (2), we estimate the effect of deferred compensation and pensions separately. However, the estimates are not significant. In model (3), we create a (0,1) dummy for the ratio of the sum of deferred compensation and pensions to equity holdings. The dummy takes the value 1 whenever the firm's ratio is above the median value of the ratio in the sample (29%). We find that firms with an investment in deferred pay and pensions relative to equity holdings above the median, experience a lower credit spread at the proxy announcement. We create two more dummies separately for the ratios of deferred pay to equity holdings and pensions to equity holdings, equal to 1 for observations above the median of the sample (7% and 14%, respectively), and these estimates are reported in model (4). We find firms with higher than median investment in deferred compensation experience 2.6% larger reduction in their CDS spreads net of market movements relative to firms below the median investment. The high pension dummy is not significant, however.

Table 1. Summary Statistics of CEO Compensation Disclosed in Proxy Statements for the banks with CDS spreads

Variable	Mean	Median	Standard Deviation
Total Wealth ($MM)[1]	287.26	95.24	83.937
Value of Stock Holdings ($MM)	230.81	39.87	83.714
Value of Option Holdings ($MM)	35.13	21.59	30.83
PV of Deferred Comp ($MM)	10.70	4.82	17.71
PV of Pension Balance ($MM)	10.61	6.14	11.77
Deferred Comp / Total Wealth (%)	7	6	8
Pension / Total Wealth (%)	11	11	10
Deferred Comp + Pensions / Equity (%)	26	29	22
Deferred Comp / Equity (%)	10	7	12
Pension / Equity (%)	16	14	14

[1] Sum of value of equity, options and restricted stocks, pensions, and deferred compensation.

Table 2: Cross-section Regression of Cumulative CDS Abnormal Spread Changes on Newly Disclosed CEO Compensation

Dependent Variable: Cumulative CDS Abnormal Spread Changes over (0 , 1)

	(1)	(2)	(3)	(4)
Constant	0.016*	0.016	0.011	0.021**
	(1.83)	(1.69)	(1.16)	(2.49)
Pension + Deferred Comp / Equity	-0.055**			
	(2.77)			
Deferred Comp / Equity		-0.058		
		(1.36)		
Pension / Equity		-0.052		
		(1.14)		
High (Pension + Deferred Comp) / Equity[2]			-0.021*	
			(1.90)	
High Deferred Comp / Equity				-0.026*
				(1.84)
High Pension / Equity				-0.018
				(1.34)
R-squared	13%	13%	11%	33%

Robust t statistics in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

[2] High implies above the median value for the sample.

References

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