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Incentive Features in CEO Compensation in the Banking Industry

1. Introduction

The topic of corporate governance in general, and top-management compensation in particular, has received enormous attention in recent years.[1] Although an increasing literature has examined various aspects of the corporate governance of manufacturing firms in the United States and abroad, the corporate governance of banks and financial institutions has received relatively less focus.

Alignment of the incentives of top management with the interests of shareholders has been characterized as an important mechanism of corporate governance.[2] Managerial ownership of equity and options in the firm, as well as other incentive features in managers' compensation structures (such as performance-related bonuses and performance-contingent promotions and dismissals), serves to align managerial incentives with shareholder interests. In fact, there is a large theoretical and empirical literature on the role of incentive contracts in ameliorating agency problems.[3] The empirical literature has emphasized the role of the relationship between pay and performance, measured as the pay-performance sensitivity of managerial compensation structures. Jensen and Murphy (1990) document that the pay-performance sensitivity of large manufacturing firms is only $3.25 per $1,000 increase in shareholder value. Recent studies show that this sensitivity has increased over time, and most of it comes from option and stock holdings (see Murphy [1999]).[4]

It is important to understand corporate governance and the degree of managerial alignment in banks for several reasons. First, banks differ from manufacturing firms in several key respects. For one, banks are regulated to a higher degree than manufacturing firms. Do the regulatory mechanisms play a corporate governance role?[5] For example, supervision that ensures that banks comply with regulatory requirements may play a general monitoring role. Does this monitoring substitute for or complement other mechanisms of corporate governance? In particular, does regulatory monitoring substitute for the need for incentive features in managerial compensation?[6] By understanding the interaction of regulation and corporate governance, we can gain insight into the optimal design of regulation and corporate governance of banks.

An understanding of the incentive structure that motivates the key decision makers in banks can also be important in designing effective regulation. For example, if top management is very closely aligned with equity interests in banks, which are highly leveraged institutions, it will have strong incentives to undertake high-risk investments (risky loans, risky real estate investments), even when they are not positive net-present-value investments.[7] Regulatory oversight has to take such incentive distortions into account when regulatory procedures are established. John, Saunders, and Senbet (2000) argue that regulation that takes into account the incentives of top management will be more effective than capital regulation in ameliorating risk-shifting incentives. They argue that pay-

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performance sensitivity of top-management compensation in banks may be a useful input in pricing Federal Deposit Insurance Corporation (FDIC) insurance premiums and designing bank regulation.

Another important aspect that differentiates banks from manufacturing firms is the significantly higher leverage of banks. How does leverage interact with corporate governance and managerial alignment? In addition to conventional agency problems, these highly leveraged financial institutions are susceptible to the well-known risk-shifting agency problems. In these institutions, where depositors are the primary claimholders, the objective of corporate governance is not to align top management closely with the equity holders. Top management should also be given incentives to act on behalf of debtholders to an adequate degree. In such cases, providing managers with compensation structures that have low pay-performance sensitivity may be optimal. John and John (1993) predict that managerial compensation in the banking industry should have low pay-performance sensitivity.

In this paper, we study the strength of incentive features in banks' top-management compensation contracts. We examine the properties of bank-management compensation structures, including pay-performance sensitivity, using data from 1992 to 2000. Based on existing theory, we hypothesize that the pay-performance sensitivity of firms is decreasing in debt ratios and firm size; it should also be lower for regulated firms. We test these relationships for banks, manufacturing firms, and regulated utilities. Banks are regulated, highly leveraged, and, in our sample, larger than manufacturing firms. The hypothesized relationship implies that banks should have lower pay-performance sensitivity than manufacturing firms. The empirical evidence is consistent with these hypotheses.

The study by Barro and Barro (1990) is one of the early empirical papers on bank-management compensation. The authors find, among other things, that changes in CEO compensation depend on performance, as measured by stock returns and changes in earning yields. Houston and James (1995) document that, on average, bank CEOs receive less cash compensation, are less likely to participate in stock option plans, hold fewer stock options, and receive a smaller percentage of their total compensation in the form of options and stocks than do CEOs in other industries. Ang, Lauterbach, and Schreiber (2000) study the compensation structures of top-management teams in 166 U.S. banks from 1993 to 1996. They document that the compensation structures of CEOs are different from those of other top managers: CEOs are paid more and the incentive features in their compensation structures are significantly higher.

Our paper is organized as follows. In Section 2, we explore some insights from existing theories on managerial compensation structures in general to understand CEO compensation in banks. Section 3 describes the data and summary statistics. Section 4 presents empirical results on pay-performance sensitivity in banks. In Section 5, tests of the hypotheses described in Section 2 are presented, and banks' pay-performance sensitivity is compared with that of manufacturing firms.

2. Testable Hypotheses

Our strategy here is to relate pay-performance sensitivity of firms in general to their characteristics, and make these relationships the basis for understanding pay-performance sensitivity in banks. In particular, we formulate hypotheses comparing pay-performance sensitivity in banks with sensitivity in manufacturing firms.

The theoretical literature hypothesizes that the pay-performance sensitivity of CEO compensation should be a function of the capital structure of the firm, firm size, and firm risk. John and John (1993) argue that a firm's debt ratio should be a determinant of the degree of incentive features to be included in its top-management compensation contracts. When risky debt is outstanding, a CEO who is closely aligned with the firm's shareholders will have incentives to risk-shift on behalf of equity holders. In other words, higher pay-performance sensitivity in management compensation aggravates the well-known risk-shifting incentives associated with risky debt. Managerial compensation with low pay-performance sensitivity can serve as a commitment device to minimize the agency costs of debt. The optimal managerial compensation structure in highly leveraged firms is shown to have low pay-performance sensitivity to restrain risk-shifting incentives on the part of the managers. This theory predicts that the pay-performance sensitivity in an optimally designed compensation structure will be declining in the debt ratio of the firm. Moreover, as banks have significantly higher debt ratios than the average manufacturing firm, pay-performance sensitivity in banks should be lower than it is in manufacturing firms. John, Saunders, and Senbet (2000) extend this argument to propose that bank regulation and pricing of FDIC insurance premiums should incorporate the observable incentive features of top-management compensation.

These arguments give rise to the following testable hypotheses:

Hypothesis 1: The pay-performance sensitivity of a firm should be a decreasing function of its debt ratio.

Hypothesis 2: Given their high debt ratios, banks should have a lower pay-performance sensitivity than manufacturing firms.

Researchers have also argued that pay-performance sensitivity should be inversely related to firm size and firm risk. For example, Jensen and Murphy (1990) argue that political influence might lead to smaller pay-performance sensitivity in large firms. Schaefer (1998) presents a model and offers empirical evidence that pay-performance sensitivity declines with firm size. The commercial banks in our sample are, on average, larger than the manufacturing firms, implying lower pay-performance sensitivity for banks. Holmstrom and Milgrom (1987) show that the optimal performance-related compensation component (pay-performance sensitivity) for risk-averse managers should be inversely related to firm risk. In this argument, however, an implicit assumption is that the effectiveness of a manager's effort is independent of firm risk. If managerial effort is more effective in riskier firms, then the above result may be overturned and a negative relationship between pay-performance sensitivity and firm risk may not obtain.

In addition, the pay-performance sensitivity of the compensation structure in banks could be lower than it is in manufacturing firms because banks are regulated institutions, and regulation could be a substitute for monitoring and incentivizing managers (for example, see Hirschey and Pappas [1981] and Carroll and Ciscel [1982]). Chidambaran and John (2000) argue that pay-performance sensitivity in opaque firms should be larger than it is in transparent ones. In transparent firms, monitoring is cost effective, while in opaque firms, monitoring is prohibitively costly and it is more effective to rely on the alignment of managerial incentives through high pay-performance sensitivity. One can argue that many aspects of the business of banks are more transparent than those of many manufacturing firms, say, high-tech firms. Large banks are typically followed by a large number of analysts, which may also give rise to a relatively higher degree of transparency, implying lower pay-performance sensitivity in banks.[8]

These arguments give rise to the following additional hypotheses:

Hypothesis 3: Pay-performance sensitivity should be declining in firm size.

Hypothesis 4: Pay-performance sensitivity should be declining in firm risk.

Hypothesis 5: Pay-performance sensitivity in regulated firms should be lower.

In the next three sections, we test these hypotheses.

3. Data and Summary Statistics

We obtain compensation data for bank CEOs from Standard and Poor's ExecuComp database. We start with a sample of 623 CEO-years from 1992 to 2000 for 120 commercial banks (firms with Standard Industrial Classification, or SIC, codes 6021 to 6029).[9] Five observations are then removed from the sample because the data indicate that the CEO became chief executive officer after the end of the fiscal year. Stock returns and market values of common equity are obtained from the Center for Research in Security Prices. These two data sources are matched on a fiscal-year basis. If a stock is traded on fewer than 200 days during a year, that firm-year is excluded from the sample. The final sample thus contains 607 CEO-years. To remove the effect of inflation and to make our figures comparable, we convert all dollar-valued data into constant-year 2000 dollars. The consumer price index used for this purpose is obtained from the Bureau of Labor Statistics.

We study two measures of CEO compensation (see exhibit). The first measure, referred to as direct compensation and denoted as W1, is the sum of salary, bonus, other cash compensation, option grants, and grants of restricted stock. The second is a broad measure of the CEO's changes in wealth from all sources related to his firm. This measure is referred to

Two Compensation Measures

W1: Direct Compensation	W2: Firm-Related Wealth Change
1. Salary	1. Salary
2. Bonus	2. Bonus
3. Other cash compensation	3. Other cash compensation
4. Option grants	4. Value change of option holdings
5. Restricted stock grants	5. Value change of restricted stocks
	6. Profits from exercising options
	7. Value change of direct equity holdings

as firm-related wealth change and denoted as W2. It is the sum of salary, bonus, other cash compensation, change in value of option holdings, change in value of restricted stocks, profits from exercising options, and change in value of direct equity holdings.

Two issues merit further discussion. First, we use the value change of in-the-money options to approximate the value change of total option holdings. We do so because the value of the existing options is reported only for those options that are currently in the money.[10]

Second, we include the value change of direct equity holdings in the second measure of compensation. There are debates in the literature over whether to include this component as part of compensation. Some researchers argue that it should not be included because equity holdings can be viewed as an investment decision. However, there are restrictions on insider stock sales. In addition, insider sales are costly because of the negative market reaction. Moreover, regardless of its name, the value change of direct equity holdings will certainly affect the CEO's wealth and hence his incentives. Therefore, we include it in our most comprehensive measure of compensation: the CEO's firm-related wealth change.

Table 1 reports the summary statistics for bank CEO compensation data. The median values of salary, bonus, new grants of options, and value change of option holdings are of the same order of magnitude, at around $500,000 to $600,000. However, the mean values of option grants and value change in option holdings are much larger—$1.2 million and $3.2 million, respectively. It is evident that the value change of direct equity holdings also constitutes an important factor in a CEO's wealth change, with a mean value of $20 million and a median value of $6 million.

To determine if the compensation pattern changes over the years, we present the distribution of direct compensation between 1992 and 2000 (see chart). The chart's left axis indicates compensation in thousands of dollars; the line corresponds to the right axis and shows the average annual stock return for each year. Three findings are worth noting. First, total direct compensation is increasing over the years: in 1992, average direct compensation was $3 million; that amount more than doubled by 1999. Second, option grants have been increasing significantly over the 1990s while the level of salary has changed very little. In fact, the percentage of option grants in direct compensation has increased from 20 percent in 1992 to 54 percent in 2000. Third, both the increase in total direct compensation and the increase in option grants have little covariance with stock performance. If anything, it appears that bank CEOs receive an increase in option grants (relative to the previous year) when stock returns are low. In 1999, the chief executives received the highest dollar value of option grants, even though the average stock return was the lowest over the sample period.

Table 1
Compensation Data: Summary Statistics

Compensation	Mean	Median
Salary	664	650
Bonus	972	505
Other cash compensation	283	4
Option grants	1,721	614
Grants of restricted stocks	577	0
Direct compensation	4,221	2,274
Value change of option holdings	3,198	626
Profits from exercising options	1,184	94
Value change of restricted stocks	500	0
Equity holdings (percent)	1.38	0.25
Value change of equity holdings	15,515	2,812
Firm-related wealth change	20,168	5,996

Notes: The table presents summary statistics for different compensation components for 607 bank CEO-years over the 1992-2000 sample period. The sample banks are large, with a median market value of $3.4 billion, and the largest one has a market value of more than $109 billion. The banks performed well during the sample period, with a median annual stock return of 21 percent. Except where noted, figures are in thousands of dollars, adjusted to constant-year 2000 dollars.

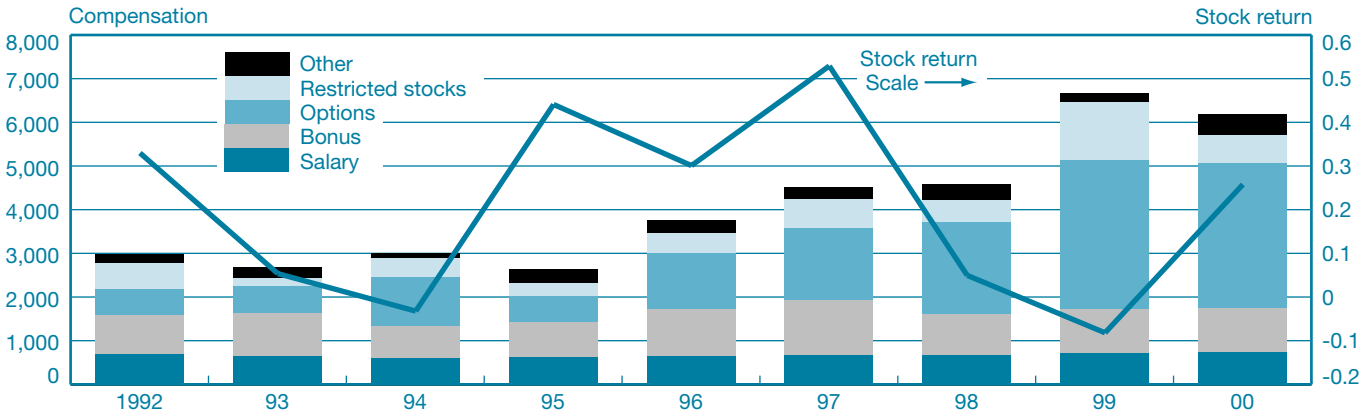
4. Pay-Performance Sensitivity of Banks

In this section, we examine the pay-performance sensitivity of CEO compensation structures in banks. As is standard practice, *we define pay-performance sensitivity as the dollar increase in CEO compensation for each $1,000 increase in shareholder value.* To estimate this measure, we run the following regression:

$$(1)\ (CEO\ compensation)_{it} = a + b^{*}\Delta(shareholder\ value)_{it} + u_{it} + \varepsilon_{it},$$

where $(CEO\ compensation)_{it}$ denotes CEO compensation for bank i in year t; $\Delta(shareholder\ value)_{it}$ denotes the shareholder value change for bank i in year t and is measured as the market value of the bank at the end of year (t-1) multiplied by the stock return in year t; u_{it} is the CEO fixed effect; and ε_{it} is the error term. As discussed in Section 3, we use two measures of CEO compensation: direct compensation (W1) and firm-related wealth change (W2).

Distribution of Direct Compensation by Year



Notes: The left axis corresponds to compensation data and is reported in thousands of constant-year 2000 dollars. The histograms depict the mean value of each component of direct compensation by year. The line represents the yearly average stock return (measured along the right axis).

The pay-performance sensitivities corresponding to the two measures of compensation are presented in Table 2, panel A. The sensitivity for direct compensation (W1) is -0.24, which is statistically significant at the 1 percent level. This means that for every $1,000 decrease in shareholder value, the bank CEO receives 24 cents more in direct compensation. The sensitivity for the broader measure of compensation, that is, firm-related wealth change (W2), is 4.70, which is also statistically significant at the 1 percent level. This means that for every $1,000 increase in shareholder value, the bank CEO receives $4.69 more in all of his firm-related wealth.

As expected, the pay-performance sensitivity of the second measure of compensation is higher. One source of this difference in sensitivity is the inclusion of CEO stock holdings in the second measure. The median stock holdings by bank CEOs are 0.25 percent. A stock ownership of 0.25 percent by a CEO would increase the pay-performance sensitivity by $2.5 per $1,000 increase in shareholder value. A second source of the higher value of pay-performance sensitivity for W2 is the inclusion of changes in the value of existing option holdings. As noted by Hall and Liebman (1998), changes in option value are an important factor contributing to high pay-performance sensitivity.

The negative value of the pay-performance sensitivity for W1 deserves some explanation. The negative coefficient of -0.24 implies that CEOs receive an increase of 24 cents in direct compensation for every $1,000 decrease in shareholder value. By examining the chart, one may see a potential explanation for this estimate. In 1999, the average firm performance of the banking industry was the lowest over the sample period; however, the direct compensation to CEOs was the highest. In particular, option grants and grants of restricted stocks to

Table 2
Pay-Performance Sensitivity of Banks

Independent Variable	Direct Compensation (1)	Firm-Related Wealth Change (2)
Panel A: Entire sample period		
Change in shareholder value	-0.24	4.70
	(-3.41)	(5.36)
R^2	0.56	0.68
Number of observations	605	439
Panel B: Excluding 1999		
Change in shareholder value	0.40	7.53
	(6.85)	(5.55)
R^2	0.77	0.71
Number of observations	532	375

Notes: The table presents the regression results of equation 1. The sample includes 607 bank CEO-years from 1992 to 2000. Column 1 displays the results with direct compensation as the dependent variable; in column 2, firm-related wealth change is the dependent variable. *t*-statistics are in parentheses.

CEOs were at their highest levels. These observations suggest a preponderance of executive stock option resettings in 1999. Resetting or repricing executive stock options refers to the common practice of lowering the exercise price of the options when the stock price has undergone a large decline.[11] This practice increases the value of the stock option to the CEO, offsetting its value decline caused by the stock price decline. It therefore leads to a sharp decrease in pay-performance sensitivity. Widespread resetting of stock options during a period of declining stock price has the potential to give rise to a negative coefficient of pay-performance sensitivity.

To see whether 1999 was an outlier year in this regard, we reestimate the coefficient of pay-performance sensitivity excluding that year (Table 2, panel B). As we expect, the sensitivity of the direct compensation measure increases: the coefficient rises from -0.24 to 0.40. Similarly, the pay-performance sensitivity of the firm-related wealth change increases from 4.70 to 7.53. These results are consistent with our argument that 1999 was an outlier year with a high frequency of stock option resetting.

5. Banks Versus Manufacturing Firms

In this section, we compare the pay-performance sensitivity of CEO compensation structures in banks with that of manufacturing firms. We also examine the possible sources of differences in pay-performance sensitivity between the two groups.

Based on the selection procedures described in Section 2, we obtain a sample of 5,659 CEO-years from 1992 to 2000 for 997 manufacturing firms (defined as firms with SIC codes 2000 to 3999).

Table 3 presents the pay-performance sensitivity of manufacturing firms for both measures of compensation. Panel A displays the regression results for the entire sample period; panel B excludes 1999. All pay-performance sensitivity coefficients are positive and highly significant. By comparing the two panels, we observe that both measures of sensitivity are higher when we exclude 1999. (A possible reason for the low sensitivity in 1999 has already been discussed in the context of banks.)

For firm-related wealth change, pay-performance sensitivity in manufacturing firms is higher than it is in banks, with or without the inclusion of 1999. However, for direct compensation, sensitivity in manufacturing firms is higher than it is in banks when 1999 is included, but lower when 1999 is excluded.

To see whether or not these differences in pay-performance sensitivity are statistically significant, we run a pooled regression with a bank dummy:

$$(2)\ (CEO\ compensation)_{it} = a + b_1 * \Delta(shareholder\ value)_{it} + b_2 * D_{bank} * \Delta(shareholder\ value)_{it} + u_{it} + \varepsilon_{it},$$

where D_{bank} is the dummy for banks, which equals 1 if the firm is a bank and 0 otherwise, and other variables are defined as before. The coefficient b_1 is the pay-performance sensitivity of manufacturing firms and (b_1+b_2) is the sensitivity of banks. If the pay-performance sensitivity of banks is lower than that of manufacturing firms, that is, if hypothesis 2 holds, then b_2 should be negative and significant.

The results for the pooled regressions under both measures of compensation appear in Table 4. Panel A provides the regression results for the entire sample period. The coefficient b_2 is negative and statistically significant at the 1 percent level for both measures of compensation. For direct compensation, pay-performance sensitivity in banks is 0.4 lower than it is in manufacturing firms. For firm-related wealth change, the sensitivity in banks is lower by $12.81 per $1,000 in shareholder value change. Panel B presents the regression results excluding

Table 3
Pay-Performance Sensitivity of Manufacturing Firms

Independent Variable	Direct Compensation (1)	Firm-Related Wealth Change (2)
Panel A: Entire sample period		
Change in shareholder value	0.16	17.50
	(6.88)	(22.26)
R^2	0.42	0.29
Number of observations	5,584	4,023
Panel B: Excluding 1999		
Change in shareholder value	0.28	28.30
	(9.59)	(26.15)
R^2	0.53	0.39
Number of observations	4,831	3,436

Notes: The table presents the regression results of equation 1. The sample includes 5,659 CEO-years of manufacturing firms from 1992 to 2000. Column 1 displays the results with direct compensation as the dependent variable; in column 2, firm-related wealth change is the dependent variable. *t*-statistics are in parentheses.

TABLE 4

Pay-Performance Sensitivity of Banks and Manufacturing Firms

Independent Variable	Direct Compensation (1)	Firm-Related Wealth Change (2)
Panel A: Entire sample period		
Change in shareholder value	0.16	17.50
	(7.16)	(23.40)
D_{bank} * change in shareholder value	-0.41	-12.81
	(-2.79)	(-2.74)
R^2	0.42	0.29
Number of observations	6,189	4,462
Panel B: Excluding 1999		
Change in shareholder value	0.28	28.30
	(10.07)	(27.47)
Bank dummy* change in shareholder value	0.13	-20.77
	(0.63)	(-3.12)
R^2	0.53	0.39
Number of observations	5,363	3,811

Notes: The table presents the regression results of equation 2. The sample includes 6,266 CEO-years for banks and manufacturing firms from 1992 to 2000. Column 1 displays the results with direct compensation as the dependent variable; in column 2, firm-related wealth change is the dependent variable. D_{bank} equals 1 if the firm is a bank and 0 otherwise. *t*-statistics are in parentheses.

1999. As before, the pay-performance sensitivity for W2 is significantly lower in banks: the difference is $20.77 per $1,000 of shareholder value change. The sensitivity for W1 in banks is not significantly different from the sensitivity in manufacturing firms. Overall, we find that the sensitivity is lower than it is in manufacturing firms, consistent with hypothesis 2.

Table 5 compares selected firm characteristics and compensation structures of banks and manufacturing firms. As we see, on average, the banks in our sample are larger: the average bank has a market capitalization of $8 billion while the average manufacturing firm's market capitalization is $5.8 billion. In addition, banks have significantly higher leverage than manufacturing firms: a debt ratio of 83.17 percent versus 32.63 percent. These univariate comparisons of size and leverage are consistent with banks' lower pay-performance sensitivity.

To test the determinants of the pay-performance sensitivity of banks relative to manufacturing firms more formally, we estimate the following regression:

$$(3)\ (CEO\ compensation)_{it} = (b_1 + b_2 * size + b_3 * risk + b_4 * debt\ ratio + b_5 * D_{bank}) * \Delta(shareholder\ value)_{it} + b_6 * size + b_7 * risk + b_8 * debt\ ratio + u_{it} + \varepsilon_{it},$$

where size is measured by the firm's market value of equity, and risk is measured by the variance of the equity value changes, that is, the square of market value of equity multiplied by stock return volatility over the year. In the above specification, a negative b_2 implies that pay-performance sensitivity decreases with firm size; a negative b_3 implies that the sensitivity decreases with firm risk, and so on.

Results of the multiple regressions for both measures of compensation are presented in Table 6. For both measures, pay-performance sensitivity decreases in the debt ratio with a significantly negative coefficient b_4. This result also holds when we exclude 1999. It is consistent with hypothesis 1, which predicts a negative relationship between pay-performance sensitivity and leverage. This is a central result that seems to be at the core of explaining the difference in pay-performance sensitivity between banks and manufacturing firms. As demonstrated in Table 5, one of the most significant differences between banks and manufacturing firms is leverage: significantly higher leverage seems to be the driving factor that determines lower pay-performance sensitivity.

A second important determinant of pay-performance sensitivity is firm size. For both measures of compensation, the coefficient b_2 is negative, although it is significant only for W2. This result is consistent with hypothesis 3. The inverse relationship between firm size and pay-performance sensitivity also has the potential to explain banks' lower pay-performance sensitivity. As is evident from Table 5, banks in our sample are significantly larger than manufacturing firms. Correspondingly, the pay-performance sensitivity is significantly lower.

To check whether regulation also plays a role in lowering the pay-performance sensitivity of banks, we ran a regression with a sample consisting of banks, manufacturing firms, and utilities, which are also regulated. In the regression, we added a dummy for regulated firms (banks and utilities) and estimated the coefficient on the cross term of the regulation dummy and the change in shareholder value. We found that the coefficient is negative for both measures of compensation, but insignificant.

Table 5

Summary Statistics: Banks Versus Manufacturing Firms

Variable	Banks (1)	Manufacturing Firms (2)	Difference (3)=(1)-(2)	*t*-statistics (4)
Panel A: Firm characteristics				
Size	8,023	5,848	2,174	3.76
Risk	112,617	273,256	-147,000	-2.50
Capital ratio (percent)	17	67	-51	-121.13
Debt ratio (percent)	83	33	51	121.13
Panel B: Compensation features				
Salary	664	568	96	9.03
Bonus	972	584	388	6.87
Other cash compensation	283	211	77	2.04
Option grants	1,721	1,894	-173	-0.84
Restricted stock grants	577	222	355	3.6
Direct compensation	4,221	3,483	738	2.54
Value change of option holdings	3,198	3,338	-140	-0.17
Profits from exercising options	1,184	1,640	-456	-2.68
Value change of restricted stocks	500	11	489	2.01
Equity holdings (percent)	1.38	3.04	-1.66	-8.61
Value change of equity holdings	15,515	15,573	-58	-0.01
Value change of option holdings	20,168	19,172	996	0.16

Notes: The table presents summary statistics for firm characteristics and compensation for banks and manufacturing firms over the 1992-2000 sample period. The sample of banks includes 607 bank CEO-years; the sample of manufacturing firms includes 5,659 CEO-years. Column 1 displays the mean values for banks; column 2 displays them for manufacturing firms. Column 3 presents the difference between columns 1 and 2. Column 4 provides *t*-statistics for the difference between banks and manufacturing firms. Firm size is measured as a firm's market value of equity and is reported in millions of constant-year 2000 dollars. Risk is measured as the square of market value of equity times stock return volatility over a fiscal year. All compensation data except for percentages are in thousands of constant-year 2000 dollars.

Table 6

Determinants of Pay-Performance Sensitivity

Independent Variable	Direct Compensation (1)	Firm-Related Wealth Change (2)
Panel A: Entire sample period		
Δ(shareholder value)	0.29	68.61
	(3.62)	(25.80)
Size* *Δ(shareholder value)*	-2.64E-06	-2.43E-04
	(-3.97)	(-11.55)
Risk* *Δ(shareholder value)*	4.22E-09	7.59E-08
	(3.66)	(2.12)
Debt ratio* *Δ(shareholder value)*	-0.89	-133.49
	(-4.72)	(-20.44)
D_{bank}* *Δ(shareholder value)*	0.16	57.33
	(0.86)	(9.70)
Size	0.24	-8.48
	(7.67)	(-8.25)
Risk	-1.34E-04	5.09E-02
	(-0.87)	(9.33)
Debt ratio	-2.20E+03	-7.21E+04
	(-1.31)	(-1.24)
R^2	0.45	0.40
Number of observations	6,175	4,455
Panel B: Excluding 1999		
Δ(shareholder value)	0.38	90.77
	(3.99)	(28.24)
Size* *Δ(shareholder value)*	-2.46E-06	-9.01E-05
	(-2.95)	(-3.19)
Risk* *Δ(shareholder value)*	3.47E-09	-2.88E-07
	(2.27)	(-6.42)
Debt ratio* *Δ(shareholder value)*	-1.10	-180.95
	(-4.88)	(-20.90)
D_{bank}* *Δ(shareholder value)*	0.56	86.89
	(2.29)	(10.93)
Size	0.21	-17.99
	(5.07)	(-13.64)
Risk	-2.65E-05	6.68E-02
	(-0.15)	(8.70)
Debt ratio	-4.28E+03	-9.47E+04
	(-2.33)	(-1.59)
R^2	0.55	0.56
Number of observations	5,351	3,805

Notes: The table presents the regression results of equation 3. The sample includes 6,266 CEO-years for banks and manufacturing firms from 1992 to 2000. Column 1 presents the results with direct compensation as the dependent variable; in column 2, firm-related wealth change is the dependent variable. *Δ (shareholder value)* is the change in shareholder value. Firm size is measured as a firm's market value of equity and is reported in millions of constant-year 2000 dollars. Risk is measured as the square of market value of equity times stock return volatility over a fiscal year. Debt ratio is measured as 1 minus the market value of common equity divided by the market value of assets, which in turn is equal to the book value of assets minus the book value of common equity plus the market value of equity. D_{bank} equals 1 if the firm is a bank and 0 otherwise. *t*-statistics are in parentheses.

6. Conclusion

This paper has examined CEO pay-performance sensitivity in the banking industry using 1992-2000 data. We find a pay-performance sensitivity in banks of $4.7 per $1,000 increase in shareholder value for the broader incentive-related measure of compensation; most of the sensitivity can be attributed to option and stock holdings. This result can be compared with the pay-performance sensitivity in general of $6 per $1,000 increase in shareholder value in 1996 (see Murphy [1999]). The evidence that pay-performance sensitivity in the banking industry, with its high leverage, is lower than it is in the manufacturing industry is consistent with our earlier hypothesis 2, which we formulated based on existing theory.

Also based on existing theory, we hypothesize that the pay-performance sensitivity in firms should decrease in the debt ratio (hypothesis 1) and in firm size (hypothesis 3); it should also be lower for regulated firms (hypothesis 5). Banks are regulated, highly leveraged, and, in our sample, larger than manufacturing firms. The hypothesized relationship implies that banks should have lower pay-performance sensitivity than manufacturing firms. We also test these relationships for banks, manufacturing firms, and regulated utilities, and we document that the pay-performance sensitivity of firms decreases with debt ratio and size (consistent with hypotheses 1 and 3). Banks have much higher leverage than manufacturing firms (debt ratios of 83 percent versus 33 percent), and, consistent with our hypothesis 2, their pay-performance sensitivity is significantly lower. In our sample, banks are also considerably larger ($8 billion average market capitalization versus $5.8 billion), which also implies lower pay-performance sensitivity in banks. The empirical evidence is consistent with these hypotheses.

Optimally designed managerial compensation structures not only align CEO interests with those of shareholders, but also signal to other stakeholders the incentive structures underlying the risk choices being made by top management. Commercial banks are unique in that depositors are the most important class of claimholders; how risky depositors perceive their debt to be will determine how costly the banks' capital will be.[12] Hence, optimal management compensation in banks that takes into account both of these roles will have a pay-performance sensitivity that is lower than it is for firms in general.

An understanding of the nature of the compensation structure that motivates banks' key decision makers can be an important tool when designing effective regulation. For example, if top management is very closely aligned with equity

interests in banks, which are highly leveraged institutions, management will have strong incentives to undertake high-risk investments. Regulatory oversight has to take such incentive distortions into account when regulatory procedures are established. John, Saunders, and Senbet (2000) argue that regulation that accounts for the incentives of top management will be more effective than capital regulation in ameliorating risk-shifting incentives. The authors contend that the pay-performance sensitivity of top-management compensation in banks may be a useful input in pricing FDIC insurance premiums and establishing regulatory procedures in the banking industry.

Endnotes

1. For example, see recent surveys by Shleifer and Vishny (1997), John and Senbet (1998), and Bradley et al. (1999).

2. For example, see Shleifer and Vishny (1997), John and Kedia (2000), and Murphy (1999). John and Kedia (2000) study the role of managerial alignment in an optimally designed corporate governance system in the presence of other mechanisms of governance such as takeovers, monitored debt, and monitoring by large outside shareholders.

3. See Murphy (1999) and Core, Guay, and Larcker (2003) for recent surveys of this extensive literature.

4. Yermack (1995) measures the incentives related to stock options via a Black and Scholes (1972) approach. Hall and Liebman (1998) contribute to the literature by adding the value change of past granted stock options as a component of the pay-performance relationship. Aggarwal and Samwick (1999) test how the risk of firms affects pay-performance sensitivity and find that high-risk firms offer low-powered compensation.

5. See Shleifer and Vishny (1997) and La Porta et al. (1998) for a discussion of the role of the legal mechanism in corporate governance.

6. Chidambaran and John (2000) show that large shareholder monitoring and pay-performance sensitivity in managerial contracts will be complementary, and Hartzell and Starks (2000) provide supporting empirical evidence. John and Kedia (2000) show that, in an optimally designed governance system, monitored debt and managerial stock ownership will be complementary, while takeovers and managerial ownership will be substitutes.

7. The risk-shifting incentives of equity-aligned management in leveraged firms are well-known; see, for example, Jensen and Meckling (1976) and John and John (1993).

8. Flannery, Kwan, and Nimalendran (1998) document that stock analysts have less disagreement about forecasts of future earnings of bank holding companies relative to forecasts of earnings of nonfinancial firms of similar size. Morgan (2002), however, focuses on bond analysts and documents larger dispersion for banks relative to nonfinancial firms. A few studies document a much smaller stock market reaction to corporate events for bank holding companies relative to manufacturing firms. For example, Cornett, Mehran, and Tehranian (1998) report -1.7 percent announcement returns for equity issues by bank holding companies (as opposed to -3 percent for manufacturing firms). A smaller market reaction has also been reported for share repurchases and dividend increases and dividend cuts. Thus, there is some evidence that at least larger banks are more transparent than nonfinancial firms.

9. The sample begins in 1992 because consistent disclosure of option portfolios began at that time.

10. The direction and magnitude of the bias resulting from this reporting convention are discussed in Aggarwal and Samwick (1999). They conclude that the direction of the bias is indeterminate and the net effect may not be severe.

11. See Brenner, Sundaram, and Yermack (2000) and Chance, Kumar, and Todd (2000) for empirical evidence of this common practice. In many cases, additional options are also granted. The ExecuComp data set that we use does not provide detailed information to distinguish between the resetting of existing options and the granting of new options.

12. Some argue that depositors do not care much about risk when the FDIC insures their accounts. However, if compensation for bank management provides risk-shifting incentives, banks will be subject to more regulation and higher priced insurance premiums. For details of this argument, see John, Saunders, and Senbet (2000).

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