Are Wall Street CEO Compensations a Complete Nonsense? A Comparison Study with Nonfinancial Industry

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Abstract

In this study, I attempt to examine the differences in executive compensation packages between the financial services industry and nonfinancial industries. Using data from 2000-2005, I investigate whether there are any differences in the CEO compensation level and structure that are not explained by common systematic economic determinants—namely firm size, firm performance, and CEO characteristics. In terms of compensation level, I find no significant difference between financial firms and nonfinancial firms. However, the pay-for-performance relationship of bonus is very significant and positive for financial firms, which is potential evidence to support a correctly incentivized bonus scheme; the opposite is true for nonfinancial firms. In general, financial firms place more emphasis on bonuses to compensate for better performance, whereas nonfinancial firms tend to make more use of stock options.

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I. Introduction

Although many people believe the economy is on its way back up, the recent global financial crisis has left considerable damages that have instigated a surge of attention to its potential causes. While there are several factors that are believed to have fueled this decline, many point to the moral hazard problem innate in the executive compensation structure in the financial services industry as being one of the key drivers of the crisis. The recent breakout of the AIG bonus incident has further enraged the media and the public, heightening once again the criticisms against Wall Street executives, once the American icons of success, for shamelessly collecting outrageous overpayments enabled by distorted compensation structures. In an interview with LA Times, Lloyd Blankfein, Chief Executive Officer (CEO) of Goldman Sachs, admitted that the financial industry needs a "renewal of common sense" and pay standards to "discourage selfish behavior, including excessive risk-taking." Critics like him say that the executive compensation structure unique to the financial industry encourages executives to take risky positions to boost short-term performance metrics in pursuit of massive annual bonus payouts. At the same time, these executives are protected from the long-term adverse effects of the risks taken[2].

In short, the heart of the recent developments and all the attention surrounding them lies in the seemingly special compensation packages for CEOs in the financial services industry relative to other industries. But are they really different? What were financial CEO compensations really like in the past, especially in the years leading up to today's financial crisis? Have financial firms' CEOs been receiving significantly more than executives in other industries? What exactly are the differences, if any, in compensation structures between financial firms and nonfinancial firms? Is the pay-for-performance sensitivity link weaker—if at all existent—for financial firms?

While there have been numerous studies on the general CEO compensation framework either on the financial industry only or on other industries, there have been relatively few previous works that directly compare compensation between financial and nonfinancial industries. When examining executive compensation, it is standard to either exclude the financial industry or look at it separately due to the unique differences in asset types and industry characteristics. While this notion is unquestioned, my goal in this study is to start filling in the gap by comparing the executive compensation packages

2 Such problematic compensation structure in the financial industry was one of the main issues addressed through the Troubled Assets Relief Program (TARP), recently implemented as the government's best effort chosen to curb the downward spiral of the economy. The most prominent conditions attached to the TARP require participating companies to eliminate or limit compensations that encourage "unnecessary and excessive" risk-taking by executives and to add "claw-back" mechanisms that recover undeserved bonuses.

between financial and nonfinancial industries. I investigate whether there are indeed any differences in the CEO compensation level and structure that are not explained by systematic economic relationships that apply to firms of all industries, such as firm size, firm performance, and CEO characteristics.

I find that there is no significant difference in the compensation levels in financial firms compared to nonfinancial firms. Moreover, for financial firms, the pay-for-performance relationship between both the level and proportion of bonus with performance is very significant and positive, evidence that may qualify claims about incorrectly structured incentive schemes. Rather surprisingly, the opposite was true for nonfinancial firms. In general, financial firms place more emphasis on bonuses to reward high performance, whereas nonfinancial firms tend to place more emphasis on stock options.

The remainder of the paper is organized as follows. Section 2 describes the background on the trend in executive compensation and the economic theories behind it. Section 3 describes the sample selection process and presents the descriptive statistics. Section 4 indentifies the variables and explains the empirical models used. Section 5 presents the empirical results and their interpretations. Section 6 concludes the study and offers future research directions.

II. Background

Much of the literature, including Murphy's extensive overview of executive compensation in the U.S., finds that executive pay levels vary by industry (Murphy 1999). During the time period of 1992 to 1996, CEOs of financial services companies earned higher pay than their counterparts in other industries[3]. He also finds that the composition of total CEO compensation was different from other industries. However, these comparisons were made on the absolute levels and compositions of CEO pay. They did not control for the general economic factors of executive compensation, so the differences need to be interpreted with a grain of salt. Foulkes (1991) explained that the increased consolidations and restructuring of financial services firms, which increased the cost of best executive talent, led to higher pay levels that "historically had only been realized by movie stars and top athletes." In addition, the continuing years of bull markets and merger and acquisition trends have driven up the total compensation level to skyrocket even more via increased incentive-based compensation.

Most prior studies on CEO pay structure have focused on stock options as the key incentive-based component. Murphy (1999) documents the explosion in stock option grants in the 1980s and 1990s. Bryant (1997) explains that loose accounting requirements allowed companies to not recognize ex-ante

3 Murphy (1999) uses SIC groups 6000-6999 to define the financial services industry.

value of options granted as expenses, making them largely invisible from corporate accounting statements. As a result of such favorable tax and accounting treatments, stock option grants had become the largest single component of CEO pay package through the 1990s and early 2000s, in both financial and nonfinancial industries alike. However, Houston and James (1995) documents the relative difference that on average, bank CEOs receive a smaller percentage of their total compensation in the form of stock options than do CEOs in other industries. Ang et al. (2000) found from studying 166 U.S. banks from 1993 to 1996 that the compensation structures of CEOs in the banking industry are weighted more heavily on performance contingent compensation.

While the predominance of stock options continued into the 2000s, the recent trend in the financial industry has been characterized by a surge of bonus usage, where unlike other industries, financial services companies awarded bonuses in greater proportions than stock options. According to a survey by Equilar, an executive compensation research firm, the S&P 500 companies' median CEO compensation fell 6.8% last year, while the median pay at financial companies suffered the biggest decline of 38.3%. This difference was mainly attributed to the fact that most companies did not pay bonuses with the faltering economy, illustrating the disproportionate amount that bonuses take up in the total pay package in the financial industry compared to other industries.

The rationale behind including incentive contingent compensation, such as bonuses and stock options, is founded in agency theory. Because of asymmetric information between the principal and the agent, as shareholders are unable to fully observe managerial actions and investment opportunities, agency theory predicts that the compensation policy will be designed to tie the shareholders' best interests to the manager's actions and objectives. Although some studies (e.g. Jensen and Murphy, 1990, Kohlmeyer and Drake, 2008) have found that pay-for-performance incentives are too weak to be consistent with the predictions of agency theory, it remains the major theoretical framework in explaining incentive-based compensation schemes in the field. While testing for the degree of effectiveness of bonus and stock options as incentive schemes is beyond the scope of this paper, past literature has documented that incentive-based pay induces risk-taking for managers. Anderson et al. (1999) further find that stock-based pay is substituted with cash bonus at a premium. Baranchuk (2006) explains this through basic agency theory that risk-averse agents substitute the riskier long-term options for cash bonuses based on short-term performance. Several studies even report unintended side effects of short-term pay-for-performance (i.e. bonuses). For example, managers may manipulate earnings to inflate short-term profits in an attempt to earn higher bonuses

(Holthausen et al., 1995; Healy, 1985).

As far as choosing key control variables of executive compensation is concerned, different studies have used different sets of determinants, yielding mixed results. However, several variables that are commonly employed include firm size, firm performance, and CEO characteristics. The theoretical foundation of these determinants can be traced back to the managerial/neoclassical debate (Ciscel and Carroll, 1980). The managerialists argue that larger firms are more complex and therefore need greater managerial talent and hence the higher pay (e.g. McGuire et al., 1962; Ciscel and Carroll, 1980). Although Murphy (1999) suggests that the explanatory power of firm size has declined over time in all industries, it is commonly asserted that compensation is closely tied to firm size measured in either revenue or assets. The neoclassicists (e.g. Lewellen and Huntsman, 1970; Masson, 1971; Crawford, 1995; Deckop, 1988) found that firm performance explained CEO earnings well, despite mixed results in follow-up studies. Most studies on executive compensation that control for CEO characteristics in the model include age as a linear variable and have found mixed results. Some labor economists found evidence of a quadratic relationship between executive pay and CEO age, where pay reaches a maximum at age 55 and then declines (Cole and Mehran, 2008). They attribute this finding to two explanations: 1) older executives tend to be more conservative and risk-averse, so they prefer to leave earnings in the firm, and 2) the life-cycle consumption model can explain that older executives require less current income to meet their consumption needs. However, others have found that using age as a quadratic independent variable to help explain wage provides a very poor fit (Murphy and Welch, 1990). CEO origin has also been identified as a fair determinant, where CEOs recruited from outside get paid more than CEOs promoted from within the firm, since outsiders require a premium in pay as an incentive to switch firms (Yanadori and Milkovich, 2002; Deckop, 1988).

III. Sample

Data

The data for this study were collected through Wharton Research Data Services[4]. The executive compensation data were obtained from Standard & Poor's ExecuComp database for the fiscal year period 1999-2005[5]. ExecuComp covers companies from the S&P 500, S&P 400 mid-cap, and S&P 600 small-cap indices and includes compensation variables for up to the top five

4 Wharton Research Data Services (WRDS): http://wrds.wharton.upenn.edu/

5 Although data was available up to 2007, the time period is chosen to be 2000-2005 only, as the new FASB-123 reporting requirements that took effect in 2006 make some data variables inconsistent.

executive officers of each company[6]. The dataset includes each CEO's firm identifier, executive identifier, salary, bonus, restricted stock grants, stock option awards, total compensation, age, date of joining the company, date of CEO succession, and stockholdings.

Each firm's accounting and financial data were obtained from Standard & Poor's Compustat database for the same time period. The dataset includes each company's firm identifier, Standard Industrial Classification (SIC) code, net income, total assets, liabilities, shareholders' equity, total common equity, total common shares outstanding, and fiscal year closing share price.

Sample Selection

I merged the two datasets—ExecuComp and Compustat—by Compustat's unique firm identifier GVKEY, and then I cross-eliminated observations that have missing counterparts from each dataset. I excluded agriculture, forestry, and fishing (SIC group 0000-0999) and public administration (9000-9999) industries, since these industries are not pertinent to my study. I eliminated fiscal year 1999 for lack of all the one-year lagged terms in my model. Although ExecuComp records up to the top five executives including the CEO, I focused my study only on CEOs, in order to reduce the effect of weighting bias of having several observations from one firm. I thereby eliminated all non-CEO executives for each firm in each fiscal year, which I indentified using the PCEO (current CEO) flag or by seeing whether an executive has a CEO appointment or termination date record.

I also eliminated observations for fiscal years in which CEOs joined or left the firm. For example, if a particular CEO with identifier 1234 was hired during fiscal year 2003, then I excluded the observation for CEO 1234 for year 2003 from my sample; if executive 1234 left the firm in 2004, then I excluded that CEO's observation for year 2004. One reason for this was to avoid counting compensations that may not be on an annual basis, for cases when the change is made in the middle of the year. The second is because compensation data for CEOs who were freshly appointed or left office during a fiscal year may include signing bonus or termination payment. Since the exact data on termination payments, exit packages, or signing bonuses were not readily available, there was no way I could remove the effects of these one-time benefits[7]. Because I am interested in the systematic difference between CEO compensation in the financial industry versus nonfinancial industries, excluding these data points with one-time effects is more relevant for the purpose of

6 I use all available large-, mid- and small-cap firms, which reduces the likelihood that my analysis will suffer from survivorship bias, unlike other prior studies that only use S&P 500 firms.

7 The exact figures of these one-time compensations are in ExecuComp starting from fiscal year 2006 due to new SEC rules that began taking effect in 2006.

my study[8].

The collection effort yielded 2,062 firms (317 firms in financial industry and 1,745 firms in nonfinancial industries), with 10,823 CEO-year observations as usable data for the analysis[9]. Table 1 details the selection process of the sample.

Table 1: Sample Selection

Initial observations from merged dataset	83,355
Cross-elimination of missing values	-42,611
Delete irrelevant SIC codes	-281
Exclude year 1999 for lack of lagROA	-6,272
Exclude Non-CEO executives	-21,980
Exclude years appointed into or left office	-1,388
Final CEO-year observations for analysis	10,823

Sample Descriptive Information

The total compensation variable I use for each fiscal year is the sum of seven components: salary, bonus, the ex-ante value of options granted, restricted stock grants, long-term incentive plan (LTIP) payouts, other annual compensation and all other compensation. Salary is typically a fixed amount that is determined by industry benchmark. Bonus is typically determined by current firm performance in terms of accounting profitability. Restricted stock grants entitle the executive to shares in the company that can be vested once certain restrictions are satisfied, such as staying with the firm for a certain number of years or meeting specific performance criteria. Long-term incentive plans have specific performance targets with payouts for meeting these plans within a set period of time. Other annual compensation includes special perks or personal benefits provided by the firm to the CEO, such as company cars, corporate jets, office renewal, and travel expenses. All other compensation consists of change-in-control payments, contributions to 401K plans, life insurance premiums, gross-ups and other tax reimbursements, and discounted share purchases, among others.

8 This process inevitably eliminates data for CEOs appointed for 2 years or less. It can be seen as a case of survivorship bias for including only "successful" (by which I mean "surviving") CEOs, potentially skewing results.

9 I follow Murphy's (1999) definition of financial services industry (SIC groups 6000-6999). See section 4.2 for further explanation.

While all the other components are straightforward and can be conveniently retrieved, ExecuComp provides two different measures of valuing stock option compensation: the aggregate value of stock options granted during the year as valued using Black-Scholes methodology (an ex-ante value measure) and the value realized from option exercises during the year as based on the exercise date payoff (an ex-post value measure). I use the Black-Scholes value which represents the estimated value of the option component of total compensation awarded in that year. ExecuComp's Black-Scholes option pricing methodology assumes a certain fixed vesting period of 70% of the typical 10-year life, or 7 years[10].

Table 2.a: Average percentage of each compensation component for financial firms

	Salary	Bonus	Other Annual	All Other Comp	Restricted Stock Grant	LTIP Payouts	Option Grant
2000	27%	21%	1%	9%	7%	4%	31%
2001	26%	19%	1%	7%	8%	2%	36%
2002	27%	22%	2%	6%	9%	3%	31%
2003	29%	24%	2%	6%	13%	3%	23%
2004	26%	25%	2%	8%	15%	3%	21%
2005	26%	25%	2%	6%	17%	5%	19%

Table 2.b: Average percentage of eac compensation component for non-financial firms

	Salary	Bonus	Other Annual	All Other Comp	Restricted Stock Grant	LTIP Payouts	Option Grant
2000	32%	17%	1%	7%	4%	2%	36%
2001	33%	14%	1%	6%	4%	2%	39%
2002	33%	17%	1%	6%	5%	2%	36%
2003	33%	19%	2%	6%	7%	3%	31%
2004	30%	20%	1%	5%	9%	3%	30%
2005	29%	20%	2%	7%	12%	4%	26%

Table 2 shows the average proportions of each of the seven compensation

10 This assumption is consistent with all literatures using data from ExecuComp.

components as a percentage of total compensation, broken down into separate years to better illustrate the industry trends during the sample period. For both financial and nonfinancial firms during the sample period, there is a noticeable increasing trend in the proportion of bonuses and of restricted stock grants, while there is a decreasing trend for the proportion of options—except for one anomalous year. In 2001, there is a temporary reversal in the general trend direction, where the average proportion of bonuses temporarily dips while the proportion of options jumps. While I am unsure of the reason (possibly having to do with the corporate accounting scandals in 2001, or weak economic conditions motivating firms and managers to link executive pay to long-term performance), this reciprocal relationship nevertheless evidences the substitution effect that exists between bonuses and stock options. The tables also reveal that the recent trend in the financial industry is to give more bonuses than stock options, while the prevalence of stock options is still higher in the nonfinancial industries. This may be because, after the bubble burst, the 1990s trend of loading up CEO compensation packages with stock options slowly depreciated and became replaced with bonuses. Although this trend also exists for the nonfinancial industry, there is less convergence as of 2005. Since salaries, bonuses, and options account for the biggest portions of total compensation, I will focus on these three components as the main dependent pay-for-performance mix variables.

IV. Variables

Dependent Variables

For the pay level measure, total compensation as defined in section 3.3 is used as the dependent variable. This is consistent with most prior research on examining compensation level. Similar to Yanadori (2002), I use the natural log of total compensation (lnTOTALCOMP) as the dependent variable to reduce heteroskedasticity and to normalize the skewed distribution of total compensation.

On the other hand, which pay mix variables to use requires more discussion, since prior studies examining pay mix use different measures. Commonly used measurements for pay mix include the ratio of cash bonus to base salary and the ratio of stock options to base salary. Other common methods are to use the ratio of cash bonus to total compensation (e.g. Anderson et al., 2000; Gomez-Mejia et al., 1987) and the ratio of stock options to total compensation. Some other measurements include the ratio of long-term incentive plan payouts to total compensation (e.g. Westphal and Zajac, 1997) and the ratio of total incentive forms to total compensation. In general, past studies

do not extensively discuss the validity of their respective pay mix measurements. The theories I employ to develop my hypotheses also do not specify which measurements are to be used. To acknowledge and to circumvent the dilemma, I decided to employ three measurements, following from Yanadori and Milkovich (2002): salary / total pay, bonus / total pay, and stock options / total pay. It is meaningful to focus on the shares of bonus and stock options as the two principal substitutable performance-sensitivity components of total pay, so I run my analysis on both. Like total compensation, the distributions of these ratios are also skewed and heteroskedastic, so I use the natural log of each ratio (David et al., 1998; Westphal and Zajac, 1997).

Independent Variables

The definition of the financial services industry varies across different studies. In his overview of executive compensation, Murphy (1999) uses SIC groups 6000-6999 to define the financial services industry in looking for differences in compensation level and pay mix. Fama and French (1997) look at banking, insurance, real estate, and trading industries separately. Some studies go as far as to look specifically at banking firms use much narrower SIC codes 6021, 6050, 6035, and 6211 to define the sample universe. Though more common, I decided that using such a narrow definition would limit my sample size of financial firms beyond reasonable usage. Instead, I adopt the definition of financial services industry used by Murphy (1999), which includes banking, insurance, and real estate investment industries. I use the FIN dummy variable to examine the difference in pay level and mix in financial firms.

Control Variables

The positive correlation between firm size and CEO compensation has been well-documented by prior studies. Measurements of firm size such as sales, number of employees, and market capitalization, differ across studies. In general, the results are qualitatively identical—they do not significantly vary in terms of coefficient size or direction, regardless of the choice of measure used. In recognition of this, I chose total revenue to control for firm size effect on total pay and applied the natural log function.

While there have been many attempts to draw a relationship between firm performance and CEO compensation, many studies have resulted in weak or even divergent empirical results. Nevertheless, it is still widely accepted that CEO compensation is closely tied to firm performance. Some common accounting measures for firm performance include return on assets (ROA) and return on equity (ROE), while a common financial measure is the change in stock price. Some studies have used Tobin's Q (market-to-book value ratio) to

measure firm performance. I chose to use ROA for my analysis to control for performance, which is most prevalently used. Moreover, since the amount of compensation paid in one year is established at the beginning of that fiscal year (except for bonus, which is determined at the end of the year), the most recent accounting ratio available to the board of directors is the one from the end of the previous fiscal year. Therefore, I lag ROA by one year to account for this. Accordingly, I excluded the observations for year 1999 because I did not have the one-year lagged data.

I also included the effect of CEO's age in my model. As for the effect of age on pay mix, I follow Yermack's (1995) finding to hypothesize that with shorter time horizon to exercise stock options, CEOs of older age would prefer cash compensation over equity compensation.

Finally, I included dummy variables for each year to vary the intercepts across time to control for the exogenous macroeconomic factors affecting the compensation, such as new accounting rule changes or economy-wide recession.

Instrumental Variables

The biggest limitation of research on executive compensation is that any model is bound to be plagued by endogeneity. While compensation level and structure are affected by CEO's performance, performance itself is also affected by the compensation policy, following from agency theory. This two-way causal relationship makes it difficult for any model to be completely free from multicollinearity and endogeneity. Many scholars have attempted to address this reciprocal relationship via an instrumental variable approach to reduce endogeneity (e.g. Abowd, 1990; Boschen and Smith, 1995; Anderson et al., 2000; Baranchuk, 2006), and they found that this improved their models greatly. Most executive compensation studies follow this general approach, although the choice of instrumental variables and simultaneous models vary.

Since performance affects compensation and vice versa, the two-way inter-causal relationship inevitable in such a model creates an issue of endogeneity. In order to address this and reduce its effect in my model as best as I can, I included lag compensation as an instrumental variable (IV), which affects present compensation through its effects on present performance. This is meant to control for the endogenous effects of past compensation on performance, and it is a widely-used method following from most executive compensation researches.

Interaction Variables

In order to examine whether the relation between compensation and per-

formance or compensation and size is different for financial firms, I included interaction variables between performance and size variables with the FIN dummy. The FIN dummy is 1 if the firm is in the financial services industry and 0 otherwise. The coefficient of FIN*Performance (where Performance is measured by lagged return on assets of the firm) changes the slope of Performance for financial firms, showing whether CEO compensation of financial firms is more sensitive to performance. Likewise, the coefficient of FIN*Size (where Size is total revenue of the firm), changing the slope of Size for financial firms, shows whether bigger financial firms give more compensation or not. In other words, these interaction variables are meant to elucidate the differential effects of performance or size on compensation, conditional on whether a firm is financial or not.

Table 3: List of variables

Variable Name	Variable Description
TOTALCOMP	Natural log of total compensation, which is the sum of salary, bonus, restricted stock grants, LTIP payouts, stock options, other annual compensation, and all other compensation
SALARY	Natural log of salary
BONUS	Natural log of bonus
OPTIONS	Natural log of the aggregate value of stock options granted as valued using Standard & Poor's Black-Scholes methodology
MIX1	Natural log of salary / total compensation
MIX2	Natural log of bonus / total compensation
MIX3	Natural log of stock options / total compensation
lagTOTALCOMP	One year lagged TOTALCOMP as instrumental variable (IV)
lagSALARY	One year lagged SALARY as instrumental variable (IV)
lagBONUS	One year lagged BONUS as instrumental variable (IV)
lagOPTIONS	One year lagged OPTIONS as instrumental variable (IV)
lagMIX1-lagMIX3	One year lagged MIX1, MIX2, and MIX3 as instrumental variable (IV)
SIZE	Natural log of total revenue
PERF	One year lagged return on assets (ROA)
AGE	CEO age
FIN	Dummy variable; taking the value of 1 if firm is in the financial services industry, 0 if otherwise
FIN*SIZE	Interaction between FIN dummy and size variable
FIN*PERF	Interaction between FIN dummy and performance variable
Year01-Year05	Dummy variables for years 2001-2005; year 2000 is the reference value to avoid the dummy variable trap

Regression Model

My goal is to test for any differences in compensation level and pay mix between firms in the financial industry and firms in other industries, controlling for firm size, performance, and CEO age. In order to do this, I pool my observations cross-sectionally to come up with the following model of equations:

$$TOTALCOMP_{i,t} = b_0 + b_1\, lagTOTALCOMP_{i,t-1} + b_2\, SIZE_{i,t} + b_3\, PERF_{i,t-1} + b_4\, AGE_{i,t} + b_5\, FIN_i + b_6\, FIN{*}SIZE_{i,t} + b_7\, FIN{*}PERF_{i,t-1} + b_{8\text{-}12}\, Year_t + u_{i,t} \quad (1)$$

$$SALARY_{i,t} = b_0 + b_1\, lagSALARY_{i,t-1} + b_2\, SIZE_{i,t} + b_3\, PERF_{i,t-1} + b_4\, AGE_{i,t} + b_5\, FIN_i + b_6\, FIN{*}SIZE_{i,t} + b_7\, FIN{*}PERF_{i,t-1} + b_{8\text{-}12}\, Year_t + u_{i,t} \quad (2)$$

$$BONUS_{i,t} = b_0 + b_1\, lagBONUS_{i,t-1} + b_2\, SIZE_{i,t} + b_3\, PERF_{i,t-1} + b_4\, AGE_{i,t} + b_5\, FIN_i + b_6\, FIN{*}SIZE_{i,t} + b_7\, FIN{*}PERF_{i,t-1} + b_{8\text{-}12}\, Year_t + u_{i,t} \quad (3)$$

$$OPTIONS_{i,t} = b_0 + b_1\, lagOPTIONS_{i,t-1} + b_2\, SIZE_{i,t} + b_3\, PERF_{i,t-1} + b_4\, AGE_{i,t} + b_5\, FIN_i + b_6\, FIN{*}SIZE_{i,t} + b_7\, FIN{*}PERF_{i,t-1} + b_{8\text{-}12}\, Year_t + u_{i,t} \quad (4)$$

$$MIX1_{i,t} = b_0 + b_1\, lagMIX1_{i,t-1} + b_2\, SIZE_{i,t} + b_3\, PERF_{i,t-1} + b_4\, AGE_{i,t} + b_5\, FIN_i + b_6\, FIN{*}SIZE_{i,t} + b_7\, FIN{*}PERF_{i,t-1} + b_{8\text{-}12}\, Year_t + u_{i,t} \quad (5)$$

$$MIX2_{i,t} = b_0 + b_1\, lagMIX2_{i,t-1} + b_2\, SIZE_{i,t} + b_3\, PERF_{i,t-1} + b_4\, AGE_{i,t} + b_5\, FIN_i + b_6\, FIN{*}SIZE_{i,t} + b_7\, FIN{*}PERF_{i,t-1} + b_{8\text{-}12}\, Year_t + u_{i,t} \quad (6)$$

$$MIX3_{i,t} = b_0 + b_1\, lagMIX3_{i,t-1} + b_2\, SIZE_{i,t} + b_3\, PERF_{i,t-1} + b_4\, AGE_{i,t} + b_5\, FIN_i + b_6\, FIN{*}SIZE_{i,t} + b_7\, FIN{*}PERF_{i,t-1} + b_{8\text{-}12}\, Year_t + u_{i,t} \quad (7)$$

Equations (1) to (4) are aimed at observing the differential effects of the FIN dummy on the level of compensation, as a whole package and in different components. Equations (5) to (7) will observe the differential effects of the FIN dummy on the pay mix proportions. I am using coefficients b1, b2, b3, and b4 to check the economic theory that I base my model upon. Coefficients b8 through b12 are strictly meant to be macroeconomic controlling variables, so they are omitted from further analysis. Ultimately, I want to see if there is a statistically significant coefficient of FIN (b5) and whether there are any notable differences in the effects of the control factors through coefficients of the interaction variables (b6 and b7). If b5 is significant, this would mean that there is difference in pay level between the financial and nonfinancial industries unaccounted for by the control factor set. If b6 or b7 is significant, this would mean that there is difference in sensitivity to firm size or firm performance respectively.

Table 4: Descriptive statistics and mean-difference tests

	Financial		Non-financial		Mean-difference	
	Mean [a]	Std Dev	Mean [b]	Std Dev	[a] - [b]	*t*-stat
Total Compensation ($ thousand)	6,423	10,800	4,932	11,648	1,491	-4.99 ***
Salary ($ thousand)	694	347	650	389	44	-4.54 ***
Bonus ($ thousand)	1,368	2,406	741	1,511	627	-9.97 ***
Options ($ thousand)	2,408	7,008	2,453	10,634	-45	0.21
Salary / Total Compensation	27.4%	21.9%	31.9%	25.2%	-4.6%	7.38 ***
Bonus / Total Compensation	27.7%	17.4%	23.4%	16.5%	4.3%	-8.06 ***
Options / Total Compensation	38.8%	22.5%	47.8%	24.6%	-9.0%	11.99 ***
Revenue ($ million)	5,828	13,059	4,738	14,585	1,090	-2.99 **
Return on Assets	2.6%	8.2%	0.9%	36.5%	1.6%	-3.78 ***
CEO Age	57.15	7.80	55.95	8.10	1.20	-5.44 ***
Number of CEO-years	1,561		9,262			
Number of firms	317		1,745			

1. + < 0.10, * < 0.05, ** < 0.01, *** < 0.001

V. Findings

Descriptive Statistics

Table 4 shows the descriptive summary statistics of the sample universe and mean-difference test statistics between financial and nonfinancial industries. For expositional purposes, natural log is not applied to these figures. Of the total sample, 17% of the CEO-year pairs are in the financial services industry. Some notable observations include: the average total compensation in the financial industry is significantly higher ($6.4 million versus $4.9 million); the average bonus in the financial industry is significantly higher ($1.4 million versus $0.7 million); the average share of salary and options in the financial industry is significantly lower than nonfinancial industries (27.4% versus 31.9%, and 38.8% versus 47.8%), while for bonus it is significantly higher (27.7% versus 23.4%); and an average firm in the financial industry is significantly larger in terms of total revenue generated ($5.8 billion versus $4.7 billion) with better performance as measured in ROA (2.6% versus 0.9%). It is particularly notable that all factors, except for Options, are significantly different, at

99% level or better, lending more credibility to the claim that CEO pay is very different across the two industry groups, not accounting for difference in firm size, performance, and CEO age.

Table 5: Results of OLS regression analysis of CEO compensation level

Variable	Total Comp (1)	Salary (2)	Bonus (3)	Options (4)
Intercept	2.088 ***	1.053 ***	1.205 ***	1.862 ***
IV (lagged, LN)	0.628 ***	0.832 ***	0.649 ***	0.683 ***
Size (LN)	0.148 ***	0.029 ***	0.149 ***	0.112 ***
ROA (lagged)	0.045	0.028	-0.103 **	0.125 **
Age	-0.004 ***	-0.003 ***	-0.001	-0.006 ***
FIN	0.078	0.088	-0.017	-0.249 +
FIN*Size	0.004	-0.009	0.017	0.036 +
FIN*Performance	-0.044	-0.077	0.852 *	-0.041
N	10,385	10,296	7,035	6,303
R-squared	0.553	0.699	0.626	0.587
F-statistics	1,070.68 ***	1,992.56 ***	978.30 ***	745.55 ***

1. + < 0.10, * < 0.05, ** < 0.01, *** < 0.001
2. The corresponding instrumental variable (IV) for each regression
3. Year control dummies are omitted from table
4. Columns (1) through (4) correspond to the equation numbers from section 4.6

Regression Results and Interpretations

Table 5 shows the regression results for the level of compensation. For all industries, firm size is positively correlated with compensation level (the coefficient is significant for Size, but not for FIN*Size). For all industries, older CEOs get paid less; and the effect was the greatest in the stock option level (-0.006), as was expected due to the CEO horizon effect, where older CEOs benefit less from long-term incentives with vesting periods. The associations between lagged ROA and total compensation and salary level were statistically insignificant. The lagged ROA had a positive effect on option level

(0.125) and a negative effect on bonus level (-0.103). However, for bonus, the FIN*performance interaction coefficient was significantly overriding the effect (0.852), which we could interpret as a positive net effect (0.749) on bonus level. At the statistically significant level of 5%, this suggests that bonus level is positively sensitive to prior year's performance for financial firms, while there is an opposite relationship (-0.103) for nonfinancial firms. Most importantly, however, none of the financial dummy interactions were statistically significant for model (1), which suggests that there is no difference in total compensation level for financial firms. The inclusion of the IV for each regression improved the fit by a multiple, with much higher R-squares, which seems to suggest that the endogeneity problem is addressed to a certain extent.

Table 6: Results of OLS regression analysis of CEO pay mix

Variable	Salary/Total Comp (5)	Bonus/Total Comp (6)	Options/Total Comp (7)
Intercept	-0.337 ***	-1.639 ***	-0.066
IV (lagged, LN)	0.520 ***	0.400 ***	0.633 ***
Size (LN)	-0.098 ***	0.024 ***	-0.010 +
ROA (lagged)	-0.009	-0.058	0.054 *
Age	0.005 ***	0.006 ***	-0.004 ***
FIN	0.136	0.075	-0.303 **
FIN*Size	-0.031 *	-0.002	0.032 *
FIN*Performance	-0.121	1.304 **	-0.080
N	10,296	7,035	6,303
R-squared	0.362	0.210	0.367
F-statistics	486.68 ***	155.46 ***	303.55 ***

1. + < 0.10, * < 0.05, ** < 0.01, *** < 0.001
2. The corresponding instrumental variable (IV) for each regression
3. Year control dummies are omitted from table
4. Columns (5) through (7) correspond to the equation numbers from section 4.6

Table 6 shows the regression on CEO pay mix measures. Some primary findings are: with bigger firm size, proportions of salary and options are lower

(-0.098 and -0.010), while share of bonus is higher (0.024); for older CEOs, the proportions of cash compensation like salary and bonus are larger (0.005 and 0.006), whereas that of equity compensation is smaller (-0.004). Observing the financial dummy interactions more carefully, however, with bigger firm size, the proportion of salary decreases more for financial firms (-0.031), while the proportion of options actually increases for financial firms (the coefficients on FIN*Size add to the negative effect on salary proportion and reverse the negative effect on option proportion). Nevertheless, looking at the coefficients on the FIN dummy, financial firms overall had a significantly lower proportion of option compensation (-0.303).

With better performance, the proportion of option compensation is higher, as expected from the incentive alignment concept in agency theory. For financial firms only, performance increases the proportion of bonus by a relatively large amount (1.304), while there is no statistically significant effect of performance on bonus shares for nonfinancial firms. This is especially notable since the coefficient is very high compared to any other factors, which suggests that financial firms increase the proportion of bonus by a great amount when they see a good performance record. This can be attributed to the nature of the financial industry, where CEOs' total compensation is less reliant on base salaries but dependent mostly on huge bonuses. This suggests that the bonus-to-performance link is very strong and significant in the financial industry, as opposed to the nonfinancial industry. However, the weak (insignificant) link between bonus and performance in the nonfinancial industry is surprising.

As for the effect of age, I tried both methodologies—assuming a linear relationship or a quadratic relationship—but modeling age as a linear variable yielded a better fit with reasonable significance. With R-squared values virtually the same, the F-statistics for the linear specification were significantly higher than those of the quadratic model in each equation (linear versus quadratic respectively, all were significant at 99.9% level: 1070.68 > 989.26; 1992.56 > 1840.60; 978.30 > 902.98; 745.55 > 688.26; 486.68 > 449.25; 155.46 > 143.86; 303.55 > 280.33). Hence a higher proportion of explained variance constitutes a better fit.

VI. Conclusion

Summary and Implications of Findings

My empirical results indicate that, for firms in the financial industry during the time period of my sample, there is no significant difference in the total pay level compared to nonfinancial firms, when controlling for the effect of firm and CEO characteristic differences. The popular concern that CEOs of

financial firms are overpaid is not supported by my analysis. Moreover, for financial firms, the pay-for-performance relationship between both the level and proportion of bonus with performance is very significant and positive, which suggests that the incentive scheme in the financial industry may be correctly structured. Also, financial firm CEOs tend to get a lower proportion of stock options as compensation, which may be attributed to the fact that CEOs of financial firms tend to avoid receiving vested stock options to avoid downward risk in an industry characterized by high volatility, instead favoring cash bonuses. This could be a reason why we see more moral hazard problems in the financial industry these days. It is possible that there is a certain degree of self-selection, which causes more risk-averse people to enter and climb the ladder to the top in the financial industry. Moreover, the pay-for-performance link was either very weak (statistically insignificant) or even reversed in the nonfinancial industry, which is a rather ironic finding given the public's notion that financial firms were the culprits with misaligned (or ineffective) incentive schemes. In general, financial firms place more emphasis on bonuses to compensate for better performance, whereas nonfinancial firms tend to place more emphasis on stock options. It may be that there are systematic differences in the behavior of financial firms and executives that cause a higher proportion to be paid out in bonus and less in stock options[11].

Future Research

Some future areas of research could entail a similar analysis on current data. There have been large changes in the financial industry over past two turbulent years; hence, some of the points in this paper may not fit with the more current data. Now with TARP and other provisional government regulations in executive pay, it is not certain whether the CEO compensation practice in the financial industry (or even other industries in general) would fundamentally change or revert back to the original state. If these effects are not in fact temporary, analysis conducted on those years would formulate fundamentally different statements on executive compensation practices in the United States going forward. Such studies would provide interesting empirical data on the effect of governmental regulation and how it can change CEO pay levels and practices. Another area of potential research would be to address the issue of failed financial firm CEOs' receipt of enormous exit compensation packages, which has become increasingly problematic in the recent years. It would be

11 My conclusion is not a definitive statement saying that financial CEOs are not "overpaid" relative to nonfinancial CEOs. It merely suggests that my empirical results do not provide enough evidence that they are. Furthermore, my conclusion does not imply that the compensation differences between these industries are solely due to the fact that one company is in the financial industry or not, or that my control factor set is complete.

interesting to see if exit packages for CEOs differ for the financial industry in their level and composition. If a significant difference were to be found not in the compensation during the term of the CEO but after in the exit plan, the cause of moral hazard and misaligned profit maximization behavior of financial executives may have roots in the generous severance packages termed "golden parachutes."

References

Abowd, J. "Does performance-based managerial compensation affect corporate performance?" Industrial and Labor Relations Review 43 (1990): 52S-73S.

Agrawal, A., Knoeber, C. and Tsoulouhas, T. "Are Outsiders Handicapped in CEO Successions?" Journal of Corporate Finance 12, no.3 (2006): 619-644.

Anderson, C., Becher, D. and Campbell, T. "Bank mergers, the market for bank CEOs, and managerial incentives." Journal of Financial Intermediation 13, no.1 (2004): 6-27.

Anderson, M., Banker, R. and Ravindran, S. "Interrelations Between Components of Executives' Compensation and Market and Accounting-based Performance Measures." Working paper AIM-98-1, University of Texas at Dallas (1999).

Anderson, M., Banker, R. and Ravindran, S. "Executive Compensation in the Information Technology Industry." Management Science 46, no.4 (2000): 530-547.

Ang, J., Lauterbach, B. and Schreiber, B. "Pay at the executive suite: How do US banks compensate their top management teams?" Journal of Banking & Finance 26, no.6 (2002): 1143-1163.

Baranchuk, N. "Are CEOs Charged for Stock-Based Pay? An Instrumental Variable Analysis." Working Paper Series, University of Texas at Dallas (2006).

Barro, R. and Barro, J. "Pay, Performance, and Turnover of Bank CEOs." Journal of Labor Economics 8, no.4 (1990): 448-481.

Bliss, R. and Rosen, R. "CEO Compensation and Bank Mergers." Journal of Financial Economics 61, no.1 (2001): 107-138.

Boschen, J. and Smith, K. "You can pay me now and you can pay me later: The dynamic response of executive compensation to firm performance." Journal of Business 68, no.4 (1995): 577-608.

Bryan, S., Hwang, L. and Lilien, S. "CEO Stock-Based Compensation: An Empirical Analysis of Incentive-Intensity, Relative Mix, and Economic Determinants." Journal of Business 73, no.4 (2000): 661-693.

Bryant, A. "Some second thoughts on options." The New York Times, September 21, 1997, sec. 3.1.

Cannella, Jr., A. and Lubatkin, M. "Succession as a sociopolitical process: Internal impediments to outsider selection." Academy of Management Journal 36, no.4 (1993): 763-793.

Ciscel, D. and Carroll, T. "The determinants of executive salaries: An econometric survey." Review of Economics and Statistics 62 (1980): 7-13.

Cole, R. and Mehran, H. "What Do We Know About Executive Compensation at Privately Held Firms?" FRB of New York Staff Report No. 314, 2008.

Crawford, A., Ezzell, J. and Miles, J. "Bank CEO Pay-Performance Relations and the Effects of Deregulation." Journal of Business 68, no.2 (1995): 231-256.

David, P., Kochhar, R. and Levitas, E. "The effect of institutional investors on the level and mix of CEO compensation." Academy of Management Journal 41, no.2 (1998): 200-208.

Deckop, J. "Determinants of Chief Executive Officer Compensation." Industrial and Labor Relations Review 41, no.2 (1988): 215-226.

Equilar. "CEO Pay Falls 6.8% in First Drop Since 2002. Bonuses Cut by 20.6%." Equilar Press Releases, April 7, 2009: http://www.equilar.com/press_20090407.php

Falkenberry, T. "Survivorship Bias in the Development of Equity Trading Systems." The Journal of Trading (2006).

Fama, E. and French, K. "Industry costs of equity." Journal of Financial Economics 43, no.2 (1997): 153–193.

Finkelstein, S. and Hambrick, D. "Chief Executive Compensation: A study of the intersection of markets and political processes." Strategic Management Journal 10 (1989): 121-134.

Foulkes, F. K. Executive Compensation: A Strategic Guide for the 1990s. Watertown, MA: Harvard Business Press, 1991.

Gomez-Mejia, L., Tosi, H. and Hinkin, T. "Managerial control, performance, and executive compensation." Academy of Management Journal 30 (1987): 51-70.

Hamilton, W. and Hsu, T. "Executive-pay overhaul gets backing from Goldman Sachs CEO." Los Angeles Times, April 8, 2009: http://www.latimes.com/business/la-fi-execpay8-2009apr08,0,3574531.story

Healy, P. "The Effect of Bonus Schemes on Accounting Decisions." Journal of Accounting and Economics 7, no.1 (1985): 85-107.

Holthausen, R., Larcker, D. and Sloan, R. "Annual Bonus Schemes and the Manipulation of Earnings." Journal of Accounting and Economics 19, no.1 (1995): 29-74.

Houston, J. and James, C. "CEO compensation and bank risk: Is compensation in banking structured to promote risk taking?" Journal of Monetary Economics 36, no.2 (1995): 405-431.

Hubbard, G. and Palia, D. "Executive pay and performance: Evidence from the U.S. banking industry." Journal of Financial Economics 39, no.1 (1995): 105-130.

Jensen, M. and Murphy, K. "Performance Pay and Top-Management Incentives." Journal of Political Economy 98, no.2 (1990): 225-64.

John, K. and Qian, Y. "Incentive Features in CEO Compensation in the Banking Industry." Economic Policy Review 9, no.1 (2003).

Ke, B., Petroni, K. and Safieddine, A. "Ownership Concentration and Sensitivity of Executive Pay to Accounting Performance Measures: Evidence from Publicly and Privately-Held Insurance Companies." Journal of Accounting & Economics 28, no.2 (1990): 185-209.

Kohlmeyer, J. and Drake, A. "Risk-Taking in New Project Selection: Can Bonus Incentives Overcome Past Performance History?" Management Accounting Section Meeting Paper, 2008.

Lambert, R., Larcker, D. and Keith, W. "How sensitive is executive compensation to organizational size?" Strategic Management Journal 12, no.5 (1991): 395-402.

Lewellen, W. and Huntsman, B. "Managerial Pay and Corporate Performance." American Economic Review 60, no.4 (1970): 710-720.

Masson, R. "Executive Motivations, Earnings, and Consequent Equity Performance." The Journal of Political Economy 79, no.6 (1971): 1278-1292.

McGuire, J., Chiu, J. and Elbing, A. "Executive Incomes, Sales and Profits." American Economic Review 52, no.4 (1962): 753-761.

Mehran, H. "Executive compensation structure, ownership, and firm performance." Journal of Financial Economics 38 (1995): 163-184.

Murphy, K. and Welch, F. "Empirical age-earnings profits." Journal of Labor Economics 8 (1990): 202-229.

Murphy, K. "Executive Compensation." Handbook of Labor Economics, Volume 3b, Orley Ashenfelter and David Card, eds. Amsterdam, North Holland: 2485-2563, 1999.

Parrino, R. "CEO turnover and outside succession: a cross-sectional analysis." Journal of Financial Economics 46 (1997): 165-197.

Westphal, J. D. and Zajac, E. J. "Defections from the inner circle: Social exchange, reciprocity, and the diffusion of board independence in U.S. corporations." Administrative Science Quarterly 42 (1997): 161-183.

Yanadori, Y. and Milkovich, G. "Origin of CEO and compensation strategy: Differences between insiders and outsiders." CAHRS Working Paper Series #02-03, Cornell University, 2002.

Yermack, D. "Do corporations award CEO stock options effectively?" Journal of Financial Economics 39 (1995): 237-269.

Zajac, E. "CEO selection, succession, compensation and firm performance: A theoretical integration and empirical analysis." Strategic Management Journal 11 (1990): 217-230.