CEO Compensation and Firm Performance: Did the 2007-2008 Financial Crisis Matter?

Fang Yang
University of Detroit Mercy

Burak Dolar
Western Washington University

Lun Mo
American UN Education and Psychology Center

Financial compensation of corporate officers in the context of efficiency of shareholder oversight and control has been an ongoing issue for a number of decades in the U.S. corporate environment. During the financial crisis of 2007-2008, excessive executive compensation became a focal point of criticism. The paper analyzes the effects of the recent financial crisis on the relationship between CEO compensation and firm performance, and examines whether or not the crisis reshaped this relationship between the two factors. Using the Standard and Poor's ExecuComp database, we find that the relationship between CEO compensation and firm performance demonstrates different patterns in the pre- and post-crisis periods. These results suggest that incentive-based contracts were not effective compensation tools in the aftermath of the crisis.

INTRODUCTION

Financial compensation of corporate officers in the context of efficiency of shareholder oversight and control has been an ongoing issue for a number of decades in the U.S. corporate environment. During the financial crisis of 2007-2008, excessive executive compensation became a focal point of criticism for a wide range of reasons, including providing perverse incentives for reckless management and excessive risk taking. According to the Wall Street Journal, many CEOs received substantial salaries and bonuses in 2010 when their companies experienced significant declines in the stock market. For example, John Chambers, CEO of Cisco Systems, was paid $18.87 million in 2010, as his company's stock price plunged 31.4 percent (Lublin and Mattioli, 2012). Nearly four years after the worldwide recession that followed the financial crisis, the U.S. economy and the job market have not achieved a full recovery despite positive signals and progress. Consequently, economic woes inflicted by the financial crisis kept public outrage alive and cultivated demand for the evaluation of senior management compensation packages (Mohan and Ruggiero, 2007; Conyon, 2012). Furthermore, fueled by the public's frustration, the issue of executive compensation attracted the attention of the government which initiated a sweeping financial intervention in the private sector (Bhagat and Romanott, 2009).

A large number of studies have been conducted in an attempt to understand the issue of executive compensation. Studies looking at CEO compensation typically address the issue in the context of the principal-agent model where executives assume the role of the agent while shareholders act as principals. A self-interested agent (e.g., the CEO) seeks to maximize financial as well as nonfinancial benefits from his appointment. On the other hand, as major stakeholders in the company, shareholders want the company to perform as well as possible so that they can maximize their wealth though rising share prices. In this regard, the goal of the board of directors of a corporation is to find the optimum means to compensate the CEO, while still providing him with the incentives to operate in shareholders' best interest. This dilemma faced by a firm is that of the principal-agent problem, (or the agency dilemma) which concerns with the difficulties in motivating one party (the "agent") to act in the best interest of another (the "principal") rather than acting in self-interest. CEO incentive contracts are viewed as key mechanisms for addressing this problem and mitigating the conflict of interest between managers and shareholders in corporations.

The previous literature contains a large number of studies which examine whether executive compensation is optimally set or not, and whether or not there is a link between executive compensation and firm performance. These studies generally look at the relationship between executive compensation and firm performance from the perspective of the executive because the relationship is typically moderated by the idiosyncratic characteristics of the executive (e.g., personal behaviors, concerns, or motivations). For instance, according to Gibbons and Murphy (1992), optimal incentive contracts are affected by CEOs' career concerns. CEOs are incentivized early in their career by establishing their reputation in the labor market. However, later on in their career, CEOs show higher pay-performance sensitivity and expect to be compensated for reduced career concerns. Moreover, it may even be possible for powerful CEOs having significant influence over their board of directors to set their own compensation at the expense of shareholders, thus making compensation less sensitive to firm performance (Bebchuk and Fried, 2003).

The goal of the present study is to analyze the effects of the financial crisis of 2007-2008 on the relationship between CEO compensation and firm performance, and examine whether or not the crisis reshaped this relationship. In order to be consistent with previous studies on the sensitivity of CEO compensation and firm performance (see Veliyath and Bishop, 1995; Junarsin, 2011; Shaw and Zhang, 2010; Leonard, 1990; Leone, Wu and Zimmerman, 2006, Duru and Iyengar, 2001, among others), we define the former to include cash-based compensation, stock-based compensation, and total compensation, and the latter to include accounting as well as market performances. Most of the previous studies that examined the relationship between executive pay and firm performance employed data from the years before the financial crisis. To the best of our knowledge, this paper is the first to compare the sensitivity of CEO compensation to firm performance between the pre- and post-crisis periods.

HYPOTHESES DEVELOPMENT

The purpose of this study is two-fold. First, we aim to further examine the CEO pay-firm performance relationship before the crisis (i.e., before 2007). Previous studies have found evidence to support the positive relationship between CEO cash compensation (i.e., salary or bonus, or both) and earnings performance measures (i.e., either income or sales growth) (Veliyath and Bishop, 1995; Finkelstein and Hambrick, 1989; Murphy, 1986; Shaw and Zhang, 2010). Thus, we hypothesize a positive relationship between CEO cash-based compensation and firm performance. Among the extant literature, the empirical findings about the relationship between CEO equity-based compensation and firm stock market performance have been equivocal yet, we again propose a positive relationship between the two factors. The major reason is that, as an important component of a compensation package, the equity-based compensation is used by the board of directors with the intention of motivating the management to increase stock returns. Even though managers do not have complete control over the stock market returns of their firms, equity-based grants would be acceptable to the agents only if the market returns are considered to be adequate (Veliyath and Bishop, 1995). Based on this presumed situation, we present:

Hypothesis 1a: There is a positive relationship between cash-based CEO compensation and accounting-based firm performance before 2007.
Hypothesis 1b: There is a positive relationship between cash-based CEO compensation and stock-based firm performance before 2007.
Hypothesis 1c: There is a positive relationship between equity-based CEO compensation and accounting-based firm performance before 2007.
Hypothesis 1d: There is a positive relationship between equity-based CEO compensation and stock-based firm performance before 2007.
Hypothesis 1e: There is a positive relationship between total CEO compensation and accounting-based firm performance before 2007.
Hypothesis 1f: There is a positive relation between total CEO compensation and stock-based firm performance before 2007.

The second purpose of the study is to examine whether or not the pay-performance relationship in the aftermath of the financial crisis is similar to the relationship between the two factors in the pre-crisis era. It has been noted, for instance, that CEO remuneration has not closely followed company performance in recent years. One study reports that the median CEO pay in S&P 500 companies was about $8.4 million in 2007 and did not decline while the economy was weakening (Kirkpatrick, 2009). Other statistics show that the CEO pay rose 28% in 2010, and another 15% in 2011 in the United States (Kavoussi, 2012). Though CEO pay generally fell in 2012, some CEOs delivered a disproportionately higher performance measured in stock returns in comparison to compensations they received. Therefore, we present:

Hypothesis 2a: There is no positive relationship between cash-based CEO compensation and accounting-based firm performance after 2007.
Hypothesis 2b: There is no positive relationship between cash-based CEO compensation and stock-based firm performance after 2007.
Hypothesis 2c: There is no positive relationship between equity-based CEO compensation and accounting-based firm performance after 2007.
Hypothesis 2d: There is no positive relationship between equity-based CEO compensation and stock-based firm performance after 2007.
Hypothesis 2e: There is no positive relationship between total CEO compensation and accounting-based firm performance after 2007.
Hypothesis 2f: There is no positive relation between total CEO compensation and stock-based firm performance after 2007.

ANALYSIS AND RESULTS

Data

The CEO compensation data is obtained from the Standard and Poor's ExecuComp database. We identify CEOs by searching the title column for the string "CEO". Accounting-based performance is measured through return on assets (ROA) and stock-based performance is measured through annual stock return, and both measures are available in the CRSP-COMPUSTAT merged dataset. Our sample period is from 1992 to 2011. After eliminating about 0.3% of entries as outliers through screening analysis, we were left with 32,294 observations consisting of 3,286 different firms and 6,242 different CEOs.

The variables extracted and constructed from the merged database include:

(1) Total compensation: ExecuComp variable TDC1, including salary + bonus + other annual + restricted stock grants + LTIP (long term incentive plan) payouts + all other + value of option grants.
(2) CEO cash compensation: Salary + bonus.

(3) CEO stock compensation: ExecuComp variable RSTKGRNT (Restricted stock grants) + ExecuComp variable OPTION_AWARDS_FV (Stock options measured at fair value). (see Xian and Chen, 2011 for a similar variable).
(4) Accounting–based performance: ROA.
(5) Stock-based performance: Annual stock return which is the cumulative monthly raw returns from CRSP (see Shaw & Zhang, 2010 for a similar variable).

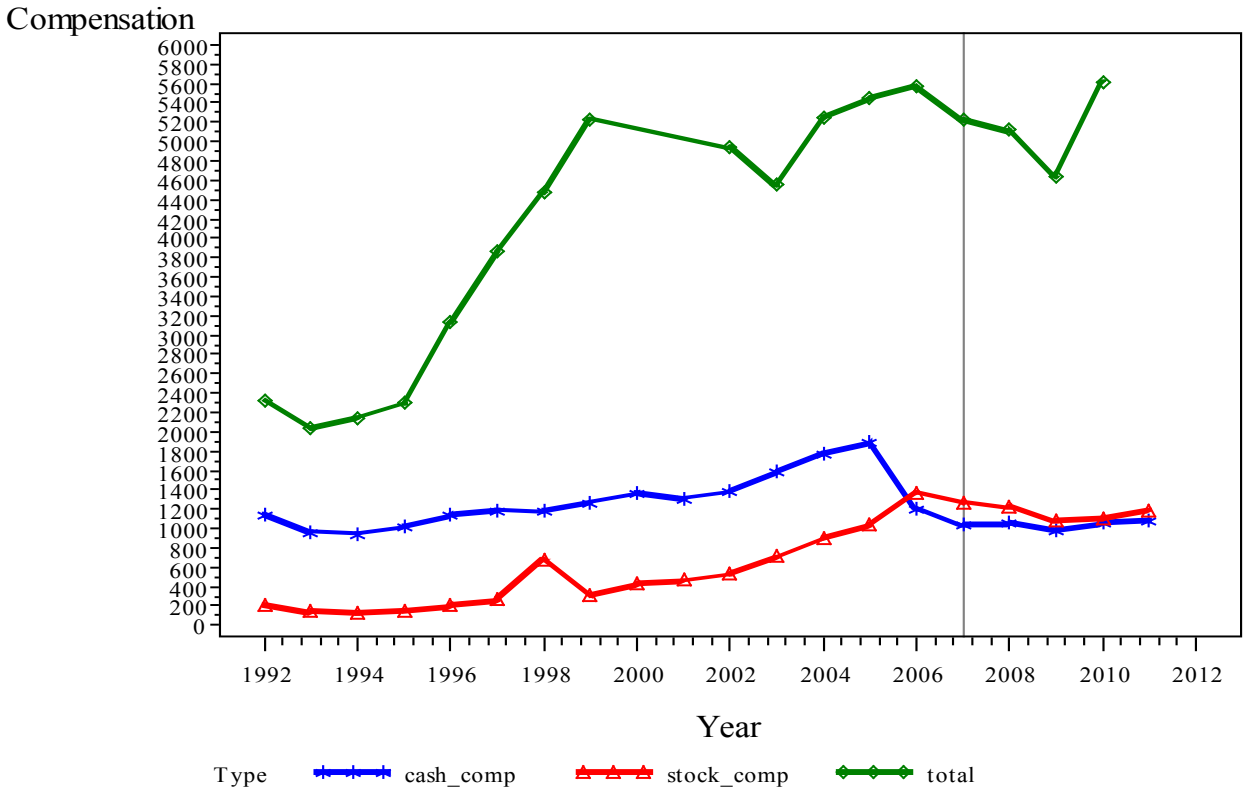
Descriptive Statistics

Table1 presents descriptive statistics of annual CEO compensation and firm performance from 1992 to 2011. The data are annual (as of December 31) and all dollar amounts are converted to constant 2011 dollars using the Consumer Price Index (CPI) deflator. The information about CEO compensation contained in Table 1 is also plotted in Figure 1. Total compensation reached its pre-crisis peak in 2006, followed by a decline until 2010, then rising rapidly and reaching its post-crisis peak in 2011. Cash-based compensation reached its peak around 2005, and stock-based compensation reached its peak around 2006, both trending downward afterwards. Interestingly, before the crisis, the average cash-based compensation was considerably higher than average stock-based compensation, while the trend reversed in the period after the crisis.

TABLE 1
CEO COMPENSATION (IN 1000s) AND FIRM PERFORMANCE FROM 1992-2011

	Total compensation	Cash-based compensation	Stock-based compensation	Accounting-based performance	Stock-based performance
1992	3,328.715	1,631.531	299.493	0.147	0.165
1993	2,779.983	1,326.944	192.870	0.142	0.173
1994	2,857.232	1,264.449	171.658	0.136	-0.014
1995	2,994.615	1,332.661	204.520	0.138	0.258
1996	4,005.189	1,452.763	263.126	0.136	0.209
1997	4,929.577	1,513.447	343.761	0.135	0.272
1998	5,758.330	1,509.841	895.944	0.132	0.138
1999	6,550.797	1,603.473	392.924	0.126	0.219
2000	8,444.242	1,695.674	530.729	0.132	0.180
2001	7,599.410	1,610.691	566.022	0.109	0.184
2002	5,968.691	1,670.421	645.830	0.106	-0.094
2003	5,399.262	1,876.214	837.382	0.112	0.451
2004	6,087.842	2,070.007	1,045.911	0.120	0.197
2005	6,164.168	2,134.950	1,174.856	0.126	0.091
2006	6,134.222	1,330.998	1,507.595	0.128	0.180
2007	5,624.515	1,115.496	1,364.361	0.120	0.003
2008	5,323.616	1,098.186	1,277.034	0.119	-0.390
2009	4,858.288	1,027.262	1,122.859	0.110	0.524
2010	5,775.255	1,090.844	1,127.845	0.128	0.290
2011	6,022.033	1,082.689	1,190.912	0.129	-0.015

FIGURE 1



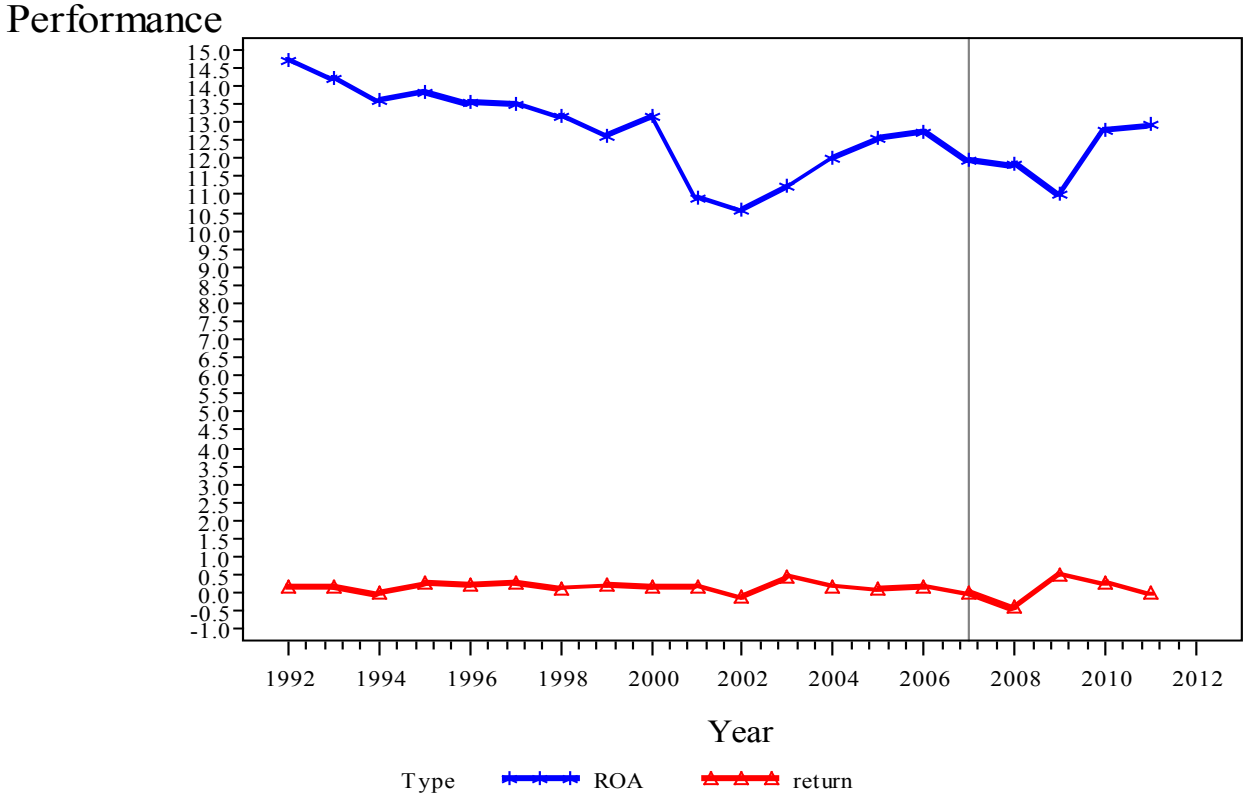
The information about firm performance contained in Table 2 is plotted in Figure 2. Generally speaking, accounting-based performance measure was more volatile, while stock-based performance measure showed a smoother trend. While both performance measures declined around the time of the crisis, they showed different patterns afterwards. The accounting-based measure continued to fall until 2009 and started to rise thereafter. The stock-based measure fell until 2008, and then started to rise but decreased again after 2009.

TABLE 2
EFFECTS OF FIRM PERFORMANCE ON CEO COMPENSATION

Compensation	Crisis	Annual Increase in Compensation		Relation with ROA	Relation with Stock Return
Cash-based Compensation	Full Period	$36,030* t=10.47	Coefficient t-value	11.56* 11.32	154.49* 8.96
Stock-based Compensation	Full Period	$94,390* t=11.57	Coefficient t-value	10.34* 3.82	-68.75 -1.07
Total Compensation	Full Period	$259,950* t=15.22	Coefficient t-value	37.55* 5.85	45.28 0.36
Cash-based Compensation	Before	$38,080* t=14.85	Coefficient t-value	11.70* 10.31	242.27* 11.18
Stock-based compensation	Before	$94,990* t=10.49	Coefficient t-value	9.53* 2.94	-39.34 -0.46
Total compensation	Before	$255,680* t=13.34	Coefficient t-value	38.92* 4.98	179.98 1.06
Cash-based Compensation	After	($4,220) t=-0.28	Coefficient t-value	5.07* 2.29	-15.22 -0.51
Stock-based compensation	After	($36,880) T=-1.92	Coefficient t-value	9.82* 2.96	-45.20 -1.17
Total compensation	After	$249,690* t=5.58	Coefficient t-value	41.82* 5.48	-294.29* -3.27

* means the value is significant at p<.05.

FIGURE 2



Regression Analysis

Our model specification incorporates both cross-sectional and time series data. We use an unbalanced panel design containing observations nested within firms and over time. The number of observations over time for each firm varies from four to ten years, with an average of about eight years per firm.

We alternately regress three dependent variables (i.e., cash-based compensation, stock-based compensation, and total compensation of CEOs) on firm performance and other control variables. We use the following model to examine the effect of the financial crisis of 2007-2008 on the relationship between company performance and CEO compensation.

$$Comp_{jt} = \beta_{0j} + \beta_{1j}\, Year_{jt} + \beta_{2j} ROA_{jt} + B_{3j} Return_{jt} + \beta_{4j} Crisis_{jt} + \varepsilon_{jt} \quad (1)$$

$$Comp_{jt} = \beta_{0j} + \beta_{1j}\, Year_{jt} + \beta_{2j} ROA_{jt} + B_{3j} Return_{jt} + \varepsilon_{jt} \quad (2)$$

$$\beta_{0j} = \beta_{00} + \varepsilon_{0j} \quad (3)$$

$$\beta_{1j} = \beta_{10} \quad (4)$$

$$\beta_{2j} = \beta_{20} \quad (5)$$

$$\beta_{3j} = \beta_{30} \quad (6)$$

$$\beta_{4j} = \beta_{40} \quad (7)$$

Equations (1) and (2) are estimated using the entire dataset which includes all observations. The difference between equations (1) and (2) is that the former includes the variable Crisis which takes a value of 0 for observations from the years 1992-2006 and a value of 1 for observations from 2007-2011. These equations are not used to estimate the two sub-datasets, one with observations from the years 1992 through 2006 and the other with observations from the years 2007 through 2011. In all equations, j

represents the cross-sectional units and t represents the time periods. $Comp_{jt}$ is the dependent variable, representing CEO compensation for company j in year t. ROA_{jt} represents accounting-based performance of company j in year t. $Return_{jt}$ denotes stock-based performance of company j in year t. β_{2j}indicates the partial effect of accounting-based performance and controls for both the intercept $\beta_{0j}$and the linear year effect (rate of change) β_{1j}. Similarly, $\beta_{3j}$is the partial effect of stock-based performance. The regression coefficients β_{00}, β_{10}, β_{20}, and β_{30} are the termed fixed effects for the mean compensation score, mean change rate, mean accounting-based performance, and mean stock-based performance, respectively. The combination of equations (1), (3), (4), (5), (6), and (7) resulted in equation (8) and the combination of equations (2), (3), (4), (5), and (6) resulted in equation (9). Equations (8) and (9) are used to analyze both the whole and subset data.

$$Comp_{jt} = \beta_{0j} + \beta_{10}\, year_{jt} + \beta_{20} ROA_{jt} + B_{30} return_{jt} + \beta_{40} Crisis_{jt} + \omega_{jt} \quad (8)$$

$$Comp_{jt} = \beta_{0j} + \beta_{10}\, year_{jt} + \beta_{20} ROA_{jt} + B_{30} return_{jt} + \omega_{jt} \quad (9)$$

Where $\omega_{jt} = \varepsilon_{jt} + \varepsilon_{0j}$, indicates random errors.

Before the 2007-2008 Financial Crisis

(1) Cash compensation

Throughout the 20-year period from 1992 to 2011, cash-based compensation significantly increased at a rate of $36,030 each year (t-value = 10.47). The results also suggest a significant and positive relationship between cash-based compensation and each of the performance measures, namely ROA (the coefficient and t-value are 11.56 and 11.32, respectfully) and annual stock return (the coefficient and t-value are 154.49 and 8.96, respectfully).

When we divide the 20-year period into pre- and post-crisis eras, we find that before the financial crisis, cash-based compensation increased at a rate of $38,080 per year (t-value = 14.85). Also, both accounting-based (the coefficient and t-value are 11.70 and 10.31, respectfully) and stock-based performance measures (the coefficient and t-value are 242.27 and 11.18, respectfully) had significantly positive impacts on cash-based compensation in the period before the financial crisis. Thus, hypotheses 1a and 1b are confirmed.

(2) Stock-based compensation

Across the twenty-year period from 1992 to 2011, stock-based compensation significantly increased at a yearly rate of $94,390 (t-value = 11.57). Accounting-based performance had a significantly positive relation to stock-based compensation (the coefficient and t-value are 10.34and 3.82, respectively). However, our results do not indicate a significant association between stock-based performance of a firm and stock-based CEO compensation for the period.

Before the financial crisis, stock-based compensation increased at a rate of $94,990 per year (t-value = 10.49), and it was significantly associated with accounting-based performance (the coefficient and t-value are 9.53 and 2.94, respectively). Although it is not statistically significant, we observe a negative relationship between stock-based compensation and stock-based performance for the pre-crisis period. Thus, hypothesis 1c is confirmed but 1d is rejected.

(3) Total compensation

Total compensation increased significantly at a rate of $ 259,950 per year (t-value = 15.22) for the entire study period. Accounting-based performance has a significant effect on total compensation (the coefficient is 37.55 and t-value = 5.85). However, we do not find the same association between stock-based firm performance and total CEO compensation for the same era.

In the period before the crisis, total compensation increased significantly at a rate of $255,680 per year (t-value = 13.34). We find a significant association between accounting-based performance and total compensation (the coefficient and t-value are 38.92 4.98, respectively) but no significant relation between stock-based performance and the latter. Therefore, hypothesis 1e is confirmed but 1f is rejected.

After the 2007-2008 Financial Crisis

(1) Cash-based compensation

We do not find a statistically significant change in cash compensation in the period after the crisis. The results imply a significant and positive relationship between cash-based CEO compensation and ROA (the coefficient is 5.07 and t-value equals 2.29).However we did not find any significant association between cash-based compensation and stock market returns of firms. Therefore, hypothesis 2a is rejected but 2b is confirmed.

(2) Stock-based compensation

In the aftermath of the financial crisis, stock-based compensation did not show a significant change but as is the case for cash based compensation, ROA had a significantly positive effect on stock-based performance (the coefficient and t-values are 9.82 and 2.96, respectively). Although not significant, we find a negative relationship between stock-based performance and compensation. Therefore, hypothesis 2c is rejected but 2 d is confirmed.

(3) Total compensation

In the post-crisis era, total CEO compensation increased at an even higher rate of $249,690 per year (t-value = 5.58). The accounting-based performance still has a statistically significant and positive effect on CEOs' total compensation, (the coefficient is 41.82 and t-value = 5.48). However, interestingly enough, our finding suggests a significantly negative relationship between stock-based performance and the latter (the coefficient and t-value are -294.29 and -3.27, respectively). Thus, hypothesis 2e is rejected but 2f is confirmed.

CONCLUDING REMARKS

The relationship between CEO compensation and firm performance demonstrates different patterns before and after the 2007-2008 financial crisis. Before the crisis, each measure of compensation (i.e., cash-based compensation, stock-based compensation, and total compensation) had a significantly positive relationship with the accounting-based firm performance of a firm. Our results also indicate a positive relationship between cash-based compensation and stock-based firm performance for the same period however, other compensation measures do not show a significant relationship with the latter.

After the 2007-2008 financial crisis, we find that each of the compensation measures is still significantly positively related to accounting-based firm performance. However, the findings show a negative yet statistically insignificant relation between both cash-based and stock-based CEO compensations, and the stock-based firm performance suggesting that the latter has no predictive power over the former compensation measures. Interestingly, we find a significantly negative relationship between total compensation and stock-based performance, indicating that in the period after the crisis while overall stock-based firm performance declined, total CEO compensation (which includes cash payments and stock options), in fact, increased. These results suggest that incentive-based contracts were not effective compensation tools in the aftermath of the crisis.

Our paper is one of the few studies comparing the relationship between CEO compensation and firm performance before and after the financial crisis. The study contributes to the literature that studies the effect of firm performance on CEO compensation in the pre- and post-crisis periods and aims to test whether or not the recent crisis has re-shaped the relationship between the two factors. We find empirical evidence indicating that CEO optimal incentive contracts are not effectual in addressing the principal-agent problem and mitigating the conflict of interest between managers and shareholders in corporations. In this respect, criticisms and concerns over the excessive executive compensation seem to be valid, especially given the destructive impact of the financial crisis on the economy of the United States and the entire world.

REFERENCES

Bebchuk, L., & Fried, J. M. (2003). Executive Compensation As An Agency Problem. *Journal of Economic Perspectives*, 17, 71-92.

Bhagat, S., & Romanott, R. (2009). Reforming Executive Compensation: Focusing and Committing to the Long-term. *YaleLaw & Economics Research Paper*, 374.

Conyon, M. J. (2012). Executive Compensation: Governance and the Financial Crisis. In D. Mueller (ed.), The Oxford Handbook of Capitalism,371-404, Oxford University Press.

Duru, A. I., & Iyengar, R. J. (2001). The Relevance of Firm's Accounting and Market Performance for CEO Compensation. *The Journal of Applied Business Research*, 17, 107-118.

Finkelstein, S. & Hambrick, D. C. (1989). Chief Executive Compensation: A Study of the Intersection of Markets and Political Processes. *Strategic Management Journal*, 10, 121–134.

Gibbons, R., & Murphy, K. J. (1992). Optimal Incentive Contracts in the Presence of Career Concerns: Theory and Evidence. *Journal of Political Economy*, 100, 468-505.

Jumarsin, E. (2011). Executive Compensation and Firm Performance: An Empirical Examination. *European Journal of Economics, Finance and Administrative Sciences*, 28, 163-179.

Kavoussi, B. (2012). CEO Pay Grew 127 Times Faster Than Worker Pay Over Last 30 Years: Study. Retrieved April 1, 2013, from: <http://www.huffingtonpost.com/2012/05/02/ceo-pay-worker-pay_n_1471685.html>.

Kirkpatrick, G. (2009). The Corporate Governance Lessons from the Financial Crisis. *OECD Journal: Financial Market Trends*, 1, 61-87.

Leonard, J. S. (1990). Executive Pay and Firm Performance. *Special issue, Industrial and Labor Relations Review*, 43, 13-29.

Leone, A., Wu, J. S, & Zimmerman, J. (2006). Asymmetric Sensitivity of CEO Cash Compensation to Stock Returns. *Journal of Accounting and Economics*, 42, 167-192.

Lublin, J. S., & Mattioli, D. 2012.CEOs Who Delivered the Most and Least Bang for the Buck. Retrieved January 2, 2013, from: <http://online.wsj.com/article/SB10001424052702304791704577416410823386798.html?mod=WSJ_hp_LEFTTopStories>.

Mohan, N., & Ruggiero, J. (2007). Influence of Firm Performance and Gender on CEO Compensation. *Applied Economics*, 39, 1107-1113.

Murphy, K. J. (1986). Corporate Performance and Managerial Remuneration: An Empirical Analysis. *Journal of Accounting and Economics*, 7, 11-42.

Shaw, K.W., & Zhang, M. (2010). Is CEO Cash Compensation Punished for Poor Firm Performance? *The Accounting Review*, 85, 1065-1093.

Veliyath, R., & Bishop, J.W. (1995). Relationship Between CEO Compensation and Firm Performance: Empirical Evidence of Labor Market Norms. *International Journal of Organizational Analysis*, 3, 268-283.

Xian, C. & Chen, H. 2011. Investment, earnings management and equity-based compensation. *Journal of Accounting Business & Management* , 18(2),121-136.