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**CEO PAY-FOR-PERFORMANCE DURING THE PERIOD
FROM 2008 TO 2012**

Master's Thesis
Accounting
September 2013

Unit Department of Accounting			
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Title CEO Pay-for-performance during the Period from 2008 to 2012			
Subject Accounting	Type of the degree Master's Thesis	Time of publication September 2013	Number of pages 74
Abstract			
<p>Purpose: Over the past five years from 2008 to 2012, important economic metrics in the United States have been in weak levels, whereas CEO pay seems to go in spite of the economic situation, thence there is a demand for studying on the true status of the pay-for-performance and providing incentives for CEOs through aligning CEO interests with shareholder interests over this economic period. Therefore, this study investigates whether CEO pay is rewarded according to firm performance over this weak economy period, and compares the result with corresponding previous findings in order to find out the specification of pay-for-performance in this economic period. In a whole, this study devotes to supply useful information on providing CEO incentives through pay-for-performance over a period with weak economic metrics.</p> <p>Design: in the theoretical part, the principal-agent problem and its solutions are investigated. CEO pay is investigated for cash compensation, incentive compensation, total compensation and CEO firm-specific wealth. Firm performance is investigated for contemporaneous and lagged accounting performance and stock market performance. The empirical study adopts a quantitative test of pay-performance sensitivity to investigate the relationship between CEO pay and firm performances. Ordinary least square regressions are applied in the empirical analysis.</p> <p>Data: the empirical analysis is based on two sets of observations: CEO compensation and firm financial information, which are both retrieved from Standard & Poor's Compustat ExecuComp database for the S&P 1500 Index firms. The two sets of observations are matched. The bank, insurance and real estate companies (SIC codes 6000-6799) are excluded.</p> <p>Findings: relative to previous findings, sensitivities between CEO pay and firm accounting performance are smaller which is driven by the looser pay-for-performance of CEO cash pay, whereas sensitivities between CEO pay and firm market performance are larger which is driven by the closer pay-for-performance of CEO incentive pay. The findings indicate that over weak economy period CEO cash pay is less used while CEO incentive pay is more frequently used to provide incentives for CEOs, and the ensuring function of base salaries tends to be more notable. This study also finds that CEO incentive pay is more significantly associated with prior performances over the period with weak economic metrics.</p> <p>In addition, when inside stockholdings are considered into CEO firm-specific wealth, negative and significant sensitivity is found for accounting performance whereas positive and significant sensitivity is found for market performance, which suggests that the raise of firm accounting performance cannot has enough positive effect on the value of CEO firm-specific wealth, and CEO firm-specific wealth is more closely tied to firm values for providing incentives for CEOs, Also, the considerable rise of CEO ownership is taken into account for the enhanced incentives.</p>			
Keywords Pay-for-performance; corporate governance, executive incentives, executive compensation; performance measurements.			
Additional information			

Abstract**Table of Contents****Tables**

1. INTRODUCTION.....	6
1.1 Background.....	6
1.2 Previous literatures	7
1.3 Purpose of the thesis.....	14
1.4 Structure of the thesis	15
2. THE PRINCIPAL-AGENT PROBLEM AND ITS SOLUTIONS.....	17
2.1 The principal-agent problem.....	17
2.2 Solutions for the principal-agent problem	18
2.2.1 Monitoring.....	19
2.2.2 Monetary incentives	20
2.2.3 Equity ownerships	22
3. CEO COMPENSATION	24
3.1 Cash compensation.....	25
3.1.1 Base salaries	25
3.1.2 Bonus plans	26
3.2 Incentive compensation.....	28
3.2.1 Stock options	28
3.2.2 Restricted stock grants.....	29
3.2.3 Other forms of payouts	30
4. FIRM PERFORMANCE.....	33
4.1 Accounting performance measurements	33
4.1.1 The pros of accounting performance measures	34
4.1.2 The cons of accounting performance measures	35
4.1.3 Updated accounting performance measures	36
4.2 Market performance measurements.....	38

4.3 Combination performance measurements	40
4.4 CEO pay and firm performance	43
4.4.1 CEO pay for firm performance.....	43
4.4.2 CEO ownership for firm performance	46
5. EMPIRICAL RESEARCH DATA AND METHODOLOGY	49
5.1 Empirical research data.....	49
5.2 Empirical research methodology	51
6 EMPIRICAL RESEARCH RESULTS	54
6.1 Sensitivities between CEO pay and firm performance	54
6.2 Sensitivities between CEO firm-specific wealth and firm performance	59
7. CONCLUSION.....	63
REFERENCES.....	68

TABLES

Table 1 Descriptive statistics on CEO pay and firm performance.....	50
Table 2 CEO pay-performance sensitivities between CEO pay and firm accounting performance.	55
Table 3 CEO pay-performance sensitivities between CEO pay and firm market performance.	57
Table 4 CEO pay-performance sensitivities between CEO firm-specific wealth and firm accounting performance.....	60
Table 5 CEO pay-performance sensitivities between CEO firm-specific wealth and firm market performance.	61

1. INTRODUCTION

1.1 Background

In the United States (US), due to the weak of the financial crisis 2007-2008 top executive pay-for-performance raises intense debates and becomes the front and center once again. Attentions on the pay-for-performance are drawn from regulations, the financial press, academics and the general public (Core & Guay 2010: 5). During the past five years from 2008 to 2012, a majority of the most important economic metrics, such as the unemployment rate, annual household income, factory output, the production of consumer goods and gross domestic product (GDP) had been at weak levels. In an economics-academic definition, the recession of the US ended in 2009, whereas at the end of 2012 the US GDP grew an anemic 0.1 percent while the unemployment rate climbed to 10 percent. According to the Federal Reserve reports, factory output fell 20 percent from 2007 to 2009, whereas by 2013 it only recovered approximately three-fourths. Production of consumer goods that decreased 14 percent during the recession is still at half of its pre-recession level by the middle of 2013. Researchers indicate that the US economy has been in a stagnant recovery after the US recession. The Economic Cycle Research Institute (ECRI) even views the current US economy is still in a recession (Obel 2013). And according to a new McClatchy-Marist poll conducted in 2013, a majority of Americans (54%) consider the country is still in an economic recession (Portlock 2013).

Nevertheless, nearly a quarter of the S&P 1500 Index firms gave their chief executive officers (CEOs) pay raises at the height of the economic recession (Stodola 2011). CEOs in large firms were paid more in 2010 than in 2007 when the US economy is booming and the unemployment rate was only half which of 2010 (Gardner 2011). “Simply put that companies don’t pay for performance” suggested by a leading executive pay consultant who investigates the pay-for-performance in the US recession and finds that no correlation exists between CEO pay and shareholder returns. It is also put forward that problems occurred in the executive pay are mainly driven by poor incentives. Chief executives are often rewarded when

they do not succeed whereas they are not penalized enough when they do lackluster jobs (Davidson 2013).

Therefore, corporate boards put more emphasis on the pay-for-performance where the principal-agent problem plays an important role especially in weak economy conditions. (Stodola 2011, Davidson 2013). The interest conflict between shareholders and CEOs is one main type for the principal-agent problem. The agency theory makes a prediction that the CEO pay policy would tie CEO welfare to firm performance and then align CEO interests with shareholder interests, thereby the principal-agent problem could be alleviated, and CEOs could be provided incentives to choose and to implement appropriate actions that will increase firm performance (Jensen & Murphy 1990b: 226).

1.2 Previous literatures

The interest conflict between shareholders and CEOs is a typical example of the principal-agent problem. Executives are inclined to be self-interested even at the expenses of shareholder interests. Therefore, negligence and profusion prevail in management affairs (Jensen & Meckling 1976; Jensen & Murphy 1990b: 226). Agency theory predicts that there are two problems incurred in the agency relationship. The first is the principal and agent's objective conflict. The second refers to the principal and agent's different attitudes toward the risk-taking (Eisenhardt 1989: 58). The direct agency costs can be divided into the corporate expenditures which benefit executives but at the cost of stockholders, and the expenses for monitoring executive actions. Indirect agency costs could be the expenses of losing an investment opportunity due to the executive risk-aversion. (Ross et al. 2008 : 11.)

As conducted by Core, Guay and Larker (2003), corporate governance is generally considered as a complementary mechanism that helps to solve the agency problems. A few of common solutions are addressed by previous studies, which including monitoring, monetary incentives, non-monetary incentives, and equity ownerships (Jensen & Meckling 1976; Jensen & Murphy 1990b: 226).

Monitoring by the board of directors, debt holders and other stakeholders has a vital impact on the performance of corporation (Core, Guay & Larker 2003). A few of governance mechanisms affecting the board monitoring effectiveness are taken into account, such as the board structure, director identities, and the CEO/chairman duality (Beatty & Zajac 1994). Monetary incentive is another important component of governance structure broadly predicted to solve the principal-agent problem (Core, Guay & Larker 2003). Monetary incentives motivate executives to improve firm performance by the means of tying the compensation levels to firm financial performance and by the means of structuring the compensations (Jensen & Murphy 1990b: 139; Ross et al. 2008.) Non-monetary incentives provided to executives are in the forms of power, prestige, the public visibility for accomplishments, as well as non-monetary punishments and dismissals for poor performances (Jensen and Murphy 1990a: 142–149.) The CEO equity ownership referring to the percentage of the firm outstanding shares owned by a CEO also has effect on providing a CEO with incentives. By controlling meaningful fractional ownerships, top executives experience direct and powerful feedbacks from market value changes (Jensen & Murphy 1990a: 145). However, top executives prefer to own a modest amount of the equity holdings of their firms. If too much risk is transferred to the executives through equity ownerships, there will be an opposite effect leading executives to be more risk-averse rather than take to take additional risks. Also an entrenchment-effect will occur if too much risk is transferred to executives by the form of ownerships. (Sanders 1999: 62.)

Only the compensation package is appropriately designed by board directors on behalf of shareholders, it provides a CEO with appropriate incentives to maximize the firm performance and shareholder values. (Bertrand & Mullainathan 2001: 901, Conyon 2006: 25.) A well-designed compensation package will accomplish the following issues: attracting and retaining the proper executives at the lowest cost; motivating executives to take actions creating shareholder values rather than destroying the firm value; and cautiously handling risks (Jensen, Murphy & Wruck 2004: 19–22). Each compensation component has different effects on motivating executives since each component generates different degrees of risk-takings and different orientations in executive decision makings (Veliyath 1999: 124).

Cooper, Gulen and Rau (2009) divide CEO compensation into cash compensation and incentive compensation. Cash compensation represents basic salaries and bonuses. Incentive compensation represents all otherwise compensations in the compensation package except cash compensation, which includes stock options, restricted stock grants, long term incentive plans and other managerial benefits (Frydman & Jenter 2010: 5). Finkelstein and Hambrick (1988) indicate that it is not only needed to consider the magnitudes of executive compensations but also needed to consider the types and structures of the compensation package.

Cash compensation is mostly used as an entitlement program rather than a motivation program for stimulating outstanding performance especially in large firms (Jensen & Murphy 1990a: 141). It typically facilitates a short-term orientation in executive decision making (Veliyath 1999: 124). Base salaries as a key component of the executive compensation contract, which main purpose and function of basic salaries are to ensure executives' livelihoods and a bit of financial stabilities (Jensen & Murphy 1990a: 141). Bonus plans are more explicitly tied to firm annual accounting performance in comparison with base salaries (Frydman & Jenter 2010; Murphy 1999: 10). In a design of bonus plans, firms use various financial and non-financial performance measures, such as accounting profits, a per-share basis measurement, a margin or return, growth rates, as well as customer satisfactions, plant safety and strategic and operational objective congruence (Murphy 1999: 111). Hall and Murphy (2003) find that incentives are maximized through restricted stock grants rather than options, when executives are offered equity-based compensation instead of equivalent cash compensation to obtain expected unchanged executive utilities. A stock option is a unique type of financial contracts, which only delivers rights but not obligations to recipients (Ross et al. 2008: 440). Restricted stocks are restricted in a sense that stock shares are forfeited under certain conditions which usually relate to employees' longevities. The forfeiture possibility allows favorable tax treatments and accounting treatments (Frydman & Jenter 2010: 6). In addition, CEOs often receive other forms of benefits such as defined-benefit pension plans, various perquisites, departure payments and severance payments which are largely decoupled from performance. These generous payouts further boost the pay-without-performance, thence firms continue failing to provide executives with incentives by these forms of compensation. (Fried & Bebchuk 2004; Frydman & Jenter 2010: 6–7.)

Various measurements are used to evaluate firm performance. The study of Merchant (2006) classifies performance measurements into three categories: accounting performance measurements, market performance measurements and combination performance measurements. Accounting performance measurements can be residual terms and ratio terms. Market performance measurements reflect changes in shareholder returns and movements in stock prices. The combination measurements involve a combination of one or both of the accounting measures and market measures, as well as a combination of disaggregated financial measures with non-financial measures. A set of criteria for evaluating the executive performance measurements is designed by Merchant (2006). For achieving the incentive purpose, a performance measurement will meet the following criteria: timeliness, accuracy, understandability, cost effectiveness, congruence with firm objectives, and controllability by executives.

Executives in most corporations are rewarded basing on accounting performances. The measures are derived from the standard rules for the financial reporting purpose. The major advantage of the accounting measures is that it excludes factors that beyond executives' controls. The result of Sloan (1993) demonstrates that accounting earnings are more sensitive to firm-specific movements in stock prices relative to market-wide movements in stock prices. Accounting performance measures are accountable for any level of managers. The rules of measuring accounting returns and accounting items in financial statements are clearly defined. External auditing checks bring more objectivities and accuracies to the measurements. Moreover, they are understandable for each manager and they are required for the financial reporting purpose, thereby there is little incremental cost of implementation. The major limitation of accounting performance measures is that they are not congruent with market value changes in numerous situations. Also, accounting measures have conservative biases. Some value changes are ignored in accounting measurements. In order to make up for the congruence failure of accounting performance measures, consulting firms propose a few of new improved accounting performance measures. (Otley 1999: 371; Merchant 2006: 902–904).

Market performance measures are based on the changes in firm market values or shareholder returns, providing indirect indications for the amounts of firm value that have been created or destroyed. They are available on a daily or even more frequent timely basis and are less manipulable by executives whose performances are being evaluated. In addition, market measures are cost effective since measurement expenses are not required for the firm. Market measures have some limitations as well. They do not always reflect realized performance since future expectations heavily affect the market values and they are not always well congruent with changes of the true firm intrinsic values. In addition, executives can manipulate stock prices in short-run through the disclosure timing (Merchant 2006: 897-898). Combination performance measurements provide more complete reflections on performances that cannot be sufficiently reflected or weighted enough by a single performance measure. They reflect interests of more stakeholders such as employees, customers, suppliers, governments and the society at large. Combination measurements can make up the backward-looking and the short-term orientation limitations of accounting performance measurements (Merchant 2006: 906-907). As the result of Merchant (2006) indicated, none of the measurement systems is perfect, studies on the advantages and disadvantages of performance measurements are still required.

The pay-for-performance relationship is broadly researched and examined since the last three decades, whereas unconscious findings are reported by previous studies. Early studies focus on the firm performance measurements that explain the differences in pay magnitudes across firms. The next generation of studies investigates the pay-for-performance incentives by examining the relationship between executive pay and firm performance. A predicted positive relationship between executive pay and the shareholder return is found by these studies. Considerable options and stockholdings owned by executives directly tie executive wealth to firm stock performance. Typically, the change in executive equity-based pay aroused by the change of market performance is much larger than the corresponding change in executive current pay. (Frydman & Jenter 2010: 10.)

Frydman and Jensen (2010) suggest that a comprehensive measure for measuring the incentive effect of CEO pay should consider all possible effects of firm performance on CEO wealth. The effects encompass the effects of firm performance on CEO

current and future pay, the effects of firm performance on the values of CEO inside stockholdings and options, and the effects of firm performance on CEO non-firm-specific wealth. Jensen and Murphy (1990b) firstly integrate most of the effects on the context of large public US firms. They report that CEO pay only raises \$3.25 for every \$1,000 increase in firm value. Jensen and Murphy (1990b) conclude that CEOs are paid like ‘bureaucrats’ in the US (Frydman & Jenter 2010: 10).

Researches use different compositions of executive pay to examine the relationships between executive pay and firm performance. Basically these studies use two compensation compositions: cash compensation (bonus and basic salary) and total compensation (involving cash compensation, stock options, restricted stocks, long-term incentive plans and other compensations). Some studies (e.g. Himmelberg et al.1999; Core, Guay & Lacker 2003) also examine the relationship between executive inside stockholdings and firm performance. (Elo 2011: 9.)

Three common pay-for-performance measuring approaches are implemented by previous studies. Jensen and Murphy (1990b) define the pay-performance sensitivity as a dollar change in CEO pay for a dollar change in firm value. As an alternative to the pay-performance sensitivity, researches such as Rosen (1990), and Hall and Liebman (1998) propose a measuring approach that a dollar change in the executive pay associated with a percentage change in firm value, which is defined as the price-performance semi-elasticity. The third measuring approach is the pay-performance elasticity, defined as a percentage change in executive pay for a percentage change in firm value (Frydman & Sakes 2010: 2129). The unique feature of the elasticity measure is that it is invariant with firm size. Murphy (1999) also indicates that the elasticity measuring approach provides a better explanation for the cross sectional variations of executive pay. Baker and Hall (2004) analyze and compare the implications of the pay-performance sensitivity and semi-elasticity measuring approaches for firms in different sizes. They find that the pay-performance semi-elasticity measure is a appreciate approach if executive decisions affect percentage returns on firm value, whereas the pay-performance sensitivity is a sufficient approach if managerial efforts are invariant with firm sizes. (Frydman & Sakes 2010: 2127-2129.)

A number of researches study on the pay-performance sensitivity. Some studies scale the studies to the pay-performance sensitivity of executive cash compensation. Slight sensitivities are found by these studies. Even if weak relationships between executive cash compensation and firm performance are generally found by previous studies, the mostly referred research of Jensen and Murphy (1990b) finds that there is a positive and significant relationship between CEO cash compensation and the firm value.

Jensen and Murphy (1990b) studies on the relationships between CEO wealth (cash compensation, option, stockholdings and CEO's dismissal) and shareholder wealth using the data of 2,213 the US CEOs' compensation and their firm values for the period from 1974 to 1986. The result suggests a \$3.3 change in CEO total compensation associates with each \$1,000 change in shareholder wealth. Moreover, the result demonstrates that the strongest pay-performance relationship was mainly driven by CEO options and firm-specific stockholdings. Also, the results are not "economically significant". The same result is observed by Hall and Liebman (1998) using data containing the detailed information of CEO inside stockholdings and stock options for the period from 1980 to 1994. The study reports that CEO total compensation is about \$1 million if their firm stocks have thirtieth percentile annual returns, which implies a strong pay-for-performance relationship after considering the CEO inside holdings and options.

Elo (2011) examines the pay-performance sensitivities between top executive contemporaneous and lagged compensations and firm accounting and stock market performances basing on the data from 2000 to 2007. It reports relatively low pay-performance sensitivities, which suggests a total revision of 99¢ for each \$1,000 change in shareholder wealth and a total revision of \$ 81.13 for each one percentage change in ROA. Also, it finds a strong pay-performance linkage created by executive inside shareholdings. And when lagged performances are considered into the tests, negative associations between executive cash pay and firm lagged performances are found. The study also investigates the effect of the market trend on the pay-performance sensitivities and demonstrates that executive pay is more closely tied to firm performance in the bear market than which in the bull market.

Matolcsy (2000) researches on the relationship between executive cash pay and firm accounting performance according to the data of Australian firms for the period from 1987 to 1995, and reports a positive relationship between executive cash pay and firm performance during an economic growth, but a weak or even zero relation during an economic soft landing, an economic recession and an economic flat recovery.

The relationship between executive compensation structure and firm performance is analyzed by Mehran (1995), implying that the compensation structure rather than the compensation magnitude motivates executives to create firm values. It also demonstrates that the positive pay-performance sensitivity is driven by the proportion of executive equity-based compensation and inside stockholdings. Main, Bruce and Buck (1996) reports 8.94 percent growth in CEO compensation relates to 10 percent growth in firm value and this statistically significant association is mainly driven by executive options. Conyon and Leech (1994) derive a slight but statistically significant elasticity between CEO base salaries and firm performance. The same result is found by Rosen (1990) which reports elasticity within a range from 0.1 to 0.15. The elasticity of 0.1 indicates that executives would be paid only 1% more compensation when excess 10 percent of annual returns is delivered. (Elo 2011: 9–10.)

1.3 Purpose of the thesis

Over the past five years from 2008 to 2012, a majority of the US important economic metrics have been at weak levels due to the long-term impact of the financial crisis 2007-08, whereas CEO pay had gone in spite of the economic situation. The top executive pay-for-performance raises intense debates and draws attentions from regulations, politicians, the financial press and academics once again. The principal-agent problem aroused by an interest conflict between executives and shareholders plays an important role especially in weak economy conditions. The CEO pay policy is expected to tie CEO welfare to firm performance and to align CEO interests with shareholder wealth. Therefore, corporate boards put more emphasis on the pay-for-performance in order to provide incentives for CEOs to solve the principal-agent

problem and to increase firm performance over the weak economy period. (Jensen & Murphy 1990b: 226; Stodola 2011; Davidson 2013).

In this background there is a demand for studying on the true status of the pay-for-performance and supplying useful information on providing incentives for top executives especially CEOs to choose and to implement appropriate actions that will increase firm performance by aligning top executives' interests with shareholders' interests in this economy condition. Therefore, this research investigates the following research question: is CEO pay rewarded according to firm performance over the past five years with weak economy metrics? In order to find out the specification of the pay-for-performance in this kind of economic period, the results of this study are compared with previous findings. In the whole, this study devotes to supply useful information on providing CEOs with incentives through the pay-for-performance over a period with weak economic metrics.

For investigate the pay-for-performance over the past five years, the empirical research of this study investigating the pay-for-performance by adopting a commonly used quantitative study approach—the first-difference pay-performance sensitivity which is a dollar change in the CEO pay for each dollar change in firm performance. The pay-for-performance sensitivity is tested by using the ordinary least square regressions (OLS) for both firm accounting performance and firm stock market performance. The observations of the empirical research are obtained from the Standard & Poor's Compustat ExecuComp database capturing the data of the US CEO pay and firm performances in the Standard and Poor's 1500 Index firms. Moreover, the results are compared with the corresponding results of Jensen and Murphy (1990b) basing on the data from 1974 to 1986, and the results of Elo (2011) basing on the data from 2000 to 2007.

1.4 Structure of the thesis

This study composes seven sections. The first section starts with introducing the background of the study. After a review of the previous literatures, the purpose of this study is identified and the research question is proposed. The second section defines the principal-agent problem and four main solutions for the problem. Various

components of CEO pay including cash compensation, incentive compensation and other forms of pay are described in the third section. The fourth section investigates the benefits and problems of performance measurements—accounting performance measurements, market performance measurements and combination performance measurements, also the relationships between CEO pay and firm performance as well as the relationships between CEO ownership and firm performance are researched in this section. Thereafter, empirical research sections are followed. The research data and the quantitative research methodology are induced in section five. The empirical research results are presented, interpreted and compared with previous study results in section six. In the final section of a conclusion the main theoretical research findings and empirical research findings relative to earlier studies are summarized. Eventually, the reliability and restrictions of this study are evaluated and avenues for further studies are suggested.

2. THE PRINCIPAL-AGENT PROBLEM AND ITS SOLUTIONS

The interest conflict between shareholders and CEOs is a typical example of the principal-agent problem. As indicated by Jensen and Meckling (1976), executives are inclined to be self-interested even at the expenses of shareholder interests. Therefore, negligence and profusion prevail in management affairs. If complete information on CEO activities and firm opportunities is perfectly observed by shareholders, a pay contract can be designed to specify and to enforce the managerial actions. However, shareholders often know neither this complete information nor which action taken by CEOs can increase the shareholder wealth. In this situation, four common solutions to solve the principal-agent problem are addressed: monitoring, monetary incentives, non-monetary incentives, and equity ownerships. (Jensen & Murphy 1990b: 226.)

2.1 The principal-agent problem

An agency relationship exists whenever someone (the principal) hires another (the agent) to represent his interests. In a corporation, the principal could be shareholders and the agent could be executives. (Ross, Westfield & Jordan 2008: 11). Agency theory predicts that there are two problems incurred in the agency relationship. The first problem is the agent problem which arises for two reasons: the first reason is due to the principal and agent's objective conflict, while the second reason arises from the expenses and difficulties for the principal to confirm whether the agent is behaving appropriately. The second problem is the principal and agent's different attitudes toward the risk-taking. Different risk preferences lead to the principal and the agent prefer different risk-taking decisions and actions. (Eisenhardt 1989: 58.)

As investigated by Bebchuk and Fried (2003), the empire building is one of the agency problems associated with executives. The empire building may reflect in the excessive growth and the excessive investment. The achieved growth can become a measure of abilities of executives. Executives are motivated by the desires of status, power, compensation, and prestige. The empire building problem arises from an absence of observability, a moral hazard and an interests' conflict. Hope and Thomas (2007) find that by the excessive growth of the firm, executives could increase the resource under their controls. And when they are less accountable to the firm's

shareholders, they more incline to make decisions for private interests at the expenses of firm value. (Hope & Thomas 2007: 595-596.)

Agency costs occur when there is an absence of monitoring on the management while managers make self-interest-maximizing decisions not in the best interests of shareholders (Hope & Thomas 2007: 596). The costs can be direct or indirect. The direct agency costs can be divided into two forms. The first form is the corporate expenditure which benefits executives at the cost of stockholders. A purchase of an unneeded corporate jet could be an example. The second form is the expenses for monitoring executive actions. For instance, in order to assess the accuracy of the financial statements, the fees paying to outside auditors would fall under this heading. Indirect agency costs could be the expense of losing an investment opportunity due to executive risk-aversion. (Ross et al. 2008: 11.)

2.2 Solutions for the principal-agent problem

As conducted by Core, Guay and Larker (2003), corporate governance is generally considered as a complementary mechanism helps align executive choices and actions with shareholder interests. Monitoring by the board of directors, debt holders and other stakeholders has a vital impact on the performance of corporation. Another important component of governance structure is the compensation policy, which is broadly predicted could solve the principal-agent problem by providing executives with incentives to select and to implement actions that will increase shareholder value.

Incentives can be divided into intrinsic incentives and extrinsic incentives. Intrinsic incentives are related to self-motivations. Extrinsic incentives can be monetary incentives and non-monetary incentives. (Franco-Santos, Bourne & Huntington 2004: 6.) As concluded by Ross et al. (2008), whether executives will act in shareholder best interests depend on how executive targets are aligned with shareholder objectives, which relates to the pay-setting and the pay-performance relationship.

2.2.1 Monitoring

Beatty and Zajac (1994) find that a high level of monitoring would be demanded if executive incentives did not tie to firm performance. In this situation, strong monitoring is more appropriate since the benefits of monitoring would outweigh the costs. Board of directors may use several governance mechanisms to increase monitoring levels on executives.

The first governance mechanism affecting the board monitoring effectiveness is the board structure. The proportion of the board outside directors is one governance design relates to monitoring. Some studies consider outside directors are experts and professional referees in firm's internal control (e.g. Fama 1980, Fama & Jensen 1983). Other studies claim that outside directors are usually co-opted by top executives (e.g. Wade, O'Reilly & Chandratat 1990). Besides, if there were a heavy proportion of inside directors who are the top executives of the firm, the board dominated by insiders would imply a self-monitoring. The monitoring level of this board structure is weak and especially weak for monitoring the CEO since the promotion of inside directors is affected by the CEO. (Beatty & Zajac 1994: 317.)

The second governance mechanism is to choose outside directors who own the equity holdings of the firm. A more vigilant monitoring is expected to be derived from outside directors who are also the owners of the firm. The third monitoring mechanism relates to block holders who are not the directors but the shareholders with the large equity holdings of the firm since the large-scale owners are inclined to engage in effective monitoring. The fourth mechanism for monitoring is associated with venture capitalists for an initial public offering firm financed by venture capital. The fifth monitoring mechanism is considered with the issue of CEO/chairman duality—whether the CEO is the chairman of the board at the same time. Attention is drawn for the separation between the CEO's role and the chairman's role. An outside chairman is expected to deliver additional monitoring on executive behaviors. When top executives are provided with low incentives from their pay contracts and equity holdings, firms tend to adopt governance mechanisms to supply higher monitoring levels. (Beatty & Zajac 1994: 318–329.)

2.2.2 Monetary incentives

Shareholders rely on CEOs to maximize their firm value through adopting appropriate actions, whereas CEOs are inclined to take activities that boom their own well-beings. Monetary incentives are expected to be created by the board of directors to align CEO best interests with shareholder interests. Monetary incentive as a form of pay policy does not only drive top executive behaviors but also determine what kind of executives is attracted by the firm. Agency theory makes a prediction that a compensation policy designed to tie the CEO's welfare with firm performance will align CEO interests with shareholder interests and give CEOs incentives to choose and implement appropriate actions that will increase firm performance. Although firm performance is affected by many factors apart from the CEO, such as public policy, demand and supply market conditions, and actions of other executives. It is appropriate to pay CEOs on the basis of firm performance and shareholders wealth because it confirms to the objective of shareholders. (Jensen & Murphy 1990b: 139, 226.)

Monetary incentives can be designed through a combination of three basic policies. The first policy is by the means of structuring the compensations, big rewards are provided for CEO superior performance and big penalties are imposed on their poor performance. The second policy is that CEOs are required to own the shares of the firm by the boards. The third policy is that dismissal can be enforced for CEOs' poor performance. (Jensen & Murphy 1990b: 139.)

Monetary incentives motivate executives to improve firm performance and shareholder value through two ways. First, executive pay is usually tied to firm financial performance in general and tied to the firm value in particular. Executives are commonly given the options to buy firm stocks at a bargain price. More values the firm reach, more valuable are these options. Options are used to motivate all levels of employees, not just top executives. Second, the motivation is derived from job opportunities and promotions. Executives with better performance will tend to be promoted. Executives who are successful in pursuing shareholder interests will be in greater demand in the labor market and have higher requirements on salaries. (Ross et al. 2008.)

When monetary incentives are more closely tied to firm performance, the average level of CEO pay would be higher, the pay for less talented executives would be lower, and the possibility of dismissal for poor performance would be higher. And then the executives would be replaced by more motivated and more competent executives who would provide better performance. Moreover, existing executives would be motivated by the incentives to enhance firm performance, while their compensation level would be increased as well. This increment of compensation is the reward for raised firm performance derived by the executive greater risk takings and efforts. It is not a wealth transfer from shareholders to executives, but a potential wealth increment for shareholders, because firm value and firm performance are rising. (Jensen & Murphy 1990a: 139.)

2.2.3 Non-monetary incentives

Non-monetary incentives provided to executives in the form of non-monetary rewards, such as power, prestige and public visibility bring incentives to executives as well as attract highly qualified executives to the firm. These non-monetary incentives are associated with success, accomplishment and non-monetary punishments. Dismissal as a consequence of poor performance provides CEOs with strong monetary and non-monetary incentives to create firm value. CEOs who are dismissed from the firm are almost improbably to find new jobs with equivalent pays, because their human capital and their value in the labor market are specific to the firm. Furthermore, due to public humiliation led by the highly visible dismissal, executives would cautiously consider the consequences of taking actions that increase the possibility of dismissal. However, CEO's position seems not to be a risky job, a CEO may not suffer a dismissal for years of poor performances because there are strong political and organizational forces defining the performance of the CEO in dimensions other than creating shareholder values. (Jensen and Murphy 1990a: 142–149.)

However, non-monetary benefits are generally in functions of a position or a rank associated by the reputation and the standing in the firm as well as in the community. They bring difficulties of aligning them with firm performance from period to period and they may create wrong incentives for executives. Also, if non-monetary

incentives did not vary positively with firm value, they would be less effective in motivating executives to act in shareholder benefits in comparison with monetary incentives. Executives may be motivated to expand the empire even at the costs of shareholder wealth. Executives also have pressures to keep peace with labor unions, to run uneconomic business, and to satisfy special-interest pressures. Therefore, executives are motivated to take actions that reduce firm competitiveness, firm productivity, and shareholder interests. (Jensen & Murphy 1990a: 149, 1990b: 257.)

Termination is an internal force that provides incentives for executives. External forces, such as the competitions in the managerial labor market, in the product market and in the market of corporate control, and takeovers as responses to inefficient internal incentives, also provide incentives for executives. Although external forces provide competitive incentives for executives, they are generally beyond direct controls of board directors. (Jensen & Murphy 1990b: 257.)

2.2.3 Equity ownerships

The CEO equity ownership refers to the percentage of the firm outstanding shares owned by a CEO, which really has effect on providing a CEO with incentives. By controlling meaningful fractional ownership, top executives experience direct and powerful feedbacks from market value changes. (Jensen & Murphy 1990a: 145.)

Equity ownership is the most powerful linkage linking executive wealth to shareholder wealth, thereby supply executives incentives to increase firm values (Jensen & Murphy 1990a: 139, Frydman & Jenter 2010: 5). However, top executives prefer to own a modest amount of the equity holdings of their firms. If too much risk is transferred to the executives through the form of equity ownerships, there will be an opposite effect leading executives to be more risk-averse rather than to take additional risks. (Sanders 1999: 62.)

Researches study on the incentive effects of executive equity ownerships suggest that when executives become significant shareholders, they are motivated to maximize firm values that also drive their personal wealth. Another perspective points out the negative effect of equity ownerships. It assumes a non-monotonic relationship

between executive ownerships and firm value. When executive ownerships rise from zero, a positive effect is expected, since interests of executives are more aligned with which of shareholders. While when executives have adequate ownerships, there will be an entrenchment-effect negatively influencing firm value (Sundaramurthy, Rhoads & Rechner 2005: 495-496). Executive entrenchment means executives entrench themselves by making manager-specific investments that are more valuable under the current executives rather than under other alternative executives, thence it will be costly for shareholders to replace the current executives, and then executives can extract higher compensations and perquisites from shareholders. (Shleifer & Vishny 1989: 1231–1241.) There are two interrelated reasons for managerial entrenchments. The first reason is that the increased ownerships transfer additional risks to risk-averse executives leading to risk-reducing behaviors. The second reason is that sufficient ownerships give executives more power to control their own compensations, dismissals, and director selections. (Sundaramurthy, Rhoads & Rechner 2005: 496.)

3. CEO COMPENSATION

CEO compensation policy as a monetary incentive is assumed to solve the principal-agent problem. Only the compensation package is appropriately designed by board directors on behalf of shareholders, it provides CEOs with appropriate incentives to maximize the firm performance and the shareholder value. (Bertrand & Mullainathan 2001: 901, Conyon 2006: 25.)

A well-designed compensation package will accomplish the following issues: attracting and retaining the proper executives at the lowest cost; motivating executives to take actions creating shareholder value rather than destroying firm value; as well as cautiously handling risks. Structuring the composition of the compensation package is to maximize executive benefits at any given costs of the shareholders while the incentive benefits would outweigh the expected costs. Different compensation compositions provide executives with different types of incentives. For instance, different proportions of basic salaries and retirement benefits will create attraction or retention incentives for executives. In addition, the composition of compensation determines the types of executives that the firm attracts. (Jensen, Murphy & Wruck 2004: 19–22.) From the view of corporate governance, each compensation component has different effects on motivating executives and each component generates different degrees of risk-taking and different orientations in executive decision makings. (Veliyath 1999: 124.)

Cooper, Gulen and Rau (2009) divide CEO compensation into cash compensation and incentive compensation. Cash compensation represents basic salaries and bonuses. Incentive compensation represents all otherwise compensations in the compensation package except cash compensation, which includes stock options, restricted stock grants, long term incentive plans and other managerial benefits such as perquisites, pensions and severance payments.(Frydman & Jenter 2010: 5.) Finkelstein and Hambrick (1988) indicate that it is not only needed to consider the magnitudes of executive compensation but also needed to consider the types and structures of the compensation package. The mix of compensations varies along the following dimensions: fixed (independent on firm performance) versus variable

(dependent on firm performance); current (accrue at the end of the year) versus deferred (accrue in later years). (Veiyath 1999: 124.)

3.1 Cash compensation

Cash compensation is expected to be structured to provide executives with rewards for outstanding performance and with penalties for poor performance. However, cash compensation is mostly used as an entitlement program rather than a motivation program for stimulating outstanding performance especially in large firms (Jensen & Murphy 1990a: 141).

Cash compensation typically facilitates a short-term orientation in executive decision making. Both base salaries and bonus plans do not necessarily motivate executives to generate long-term appreciations in firm values. Cash compensation is disclosed as a specific and tangible value in the proxy statements of the listed firms. According to a set of criteria, compensation consultants determine the appropriate cash compensation levels of executives and ensure the cash compensation conforms to norms in the external managerial labor market. (Veliyath 1999: 124-125.)

3.1.1 Base salaries

The main purpose and function of basic salaries are to ensure executives' livelihoods and a bit of financial stabilities since salaries are relatively constant over time and almost independent with firm performance. Base salaries are usually set according to industry norms that stipulate salary levels for each hierarchy position, functional area and firm size. They are also determined by the competitive benchmarking that based on general industry salary surveys and completed by detailed analyses of selected industry peers. The surveys are adjusted for firm sizes and industries. However, firm size is not a perfect proxy for job complexity, a span of control, and managerial skill requirements. Besides, labor economists usually consider the CEO's age, education and experience as the criteria of his cash compensation level. (Veliyath 1999: 124; Murphy 1999: 9.)

The determination of base salaries draws substantial attentions from executives. As a key component of the executive compensation contract, the base salary is a kind of a fixed compensation. An increment in executive base salaries is preferred by risk-averse executives rather than an increment in bonus plans or other variable compensations, because most components of a compensation package are based on the salary levels. For instance, bonuses are generally measured as a percentage of base salaries; option grants are expressed in a manner of a multiple of base salaries; pension plans and severance arrangements are dependent on salary levels as well. Therefore, the increment of base salaries will have positive influences on many other compensation components. (Murphy 1999: 9–10.)

3.1.2 Bonus plans

Bonus plans are typically offered to top executives and paid annually in either cash or stock shares. Generally, they are more explicitly tied to firm annual accounting performance in comparison with base salaries, thence they are more fluctuate than base salaries. Bonus plans are frequently linked to the performance relative to an industry benchmark, whereas the relative performance evaluation is not that effective (Frydman & Jenter 2010: 5, 15; Murphy 1999: 10).

In a design of bonus plans, firms use various financial and non-financial performance measures. Almost all firms rely on the measures of accounting profits such as net income, operating profits (EBIT), pre-tax income, revenue or economic value added. Although bonuses are usually dependent on dollar-value profits, they are also dependent on a per-share basis measurement (e.g., earnings per share EPS), a margin or return (e.g., return on equity ROE, return on assets ROA) and growth rates (e.g., EPS growth) Moreover, non-financial measures are often used as performance measures, such as customer satisfaction, plant safety, as well as strategic and operational objective congruence. The most common non-financial measures are the individual performance relative to the pre-established objective and the subjective evaluation of individual performance. As an example of the additive measure, a bonus plan has a separate schedule linking bonus payments to performance measures, where 75% is based on net income while 25% is based on sales growth. (Murphy 1999: 111–112.)

Despite the heterogeneity across firms and industries, bonus plans can be set based on performance measurements, performance standards and pay-performance relations. A minimum bonus plan expressed as a percentage of a target bonus is paid when a threshold performance is achieved. The threshold performance is usually expressed as a percentage of the performance standard. Also, when the performance standard is achieved there is typically a “cap” on bonuses paid. The “cap” is expressed as a multiple or a percentage of the target bonus. The range between the cap and the threshold is the “incentive zone” representing the performance realization range, where the incremental performance improvement conforms to the incremental bonus improvement. (Murphy 1999: 10–11.)

Although accounting measurement as the basement of bonus plans is verifiable and understandable, there are two fundamental problems with accounting measures. First, accounting profits are with the short-run and the backward-looking intrinsic substances. Executives who focus on accounting profits may concentrate on the short-term profitability and neglect the future profitability, thus may take actions like cutting the research and development expenditures at the costs of the firm future profitability. Second, accounting profits can be manipulated either by shifting earnings across periods or by discretionary accrual adjustments (Murphy 1999: 14). Board of directors exercise discretions in the allocation of fixed bonus pools. A few of possible discretions generate small adjustments in the determination of bonus plans. Some portions of CEO bonus plans are dependent on the individual performance which weights rarely exceed 25% (Murphy 1999: 11).

Fried and Bebchuk (2004) claim that although a bonus plan is regarded as a performance-based compensation, it is often weakly tied to performance. Bonuses are often conditioned on easily achieved performance targets which do not reflect good performance relative to peer firms. Also, bonuses are rewarded for issues that not relating to performance, such as making acquisitions, positive developments in the whole sector or market, and other types of luck. (Fried & Bebchuk 2004: 151.)

3.2 Incentive compensation

As defined by Cooper et al. (2009), incentive compensation includes options granted, restricted stock grants, long-term incentive payouts and other non-cash compensations. For providing a CEO with an appropriate level of incentives, a firm may compensate a CEO with equity-based compensations as a substitute of cash compensation. Although it is more expensive to use risky claims such as options and restricted stocks to compensate risk-averse executives rather than to use cash compensation, firms with cash constraints prefer to use these forms of incentive compensation, since equity-based compensation does not require contemporaneous cash payouts. The use of equity-based compensation could also be driven by accounting treatment and tax motivations. (Core, Guay & Larcker 2003: 33–34.)

3.2.1 Stock options

In the 1980s and especially in the 1990s, stock options play a role as the largest component of the top executive pay (Frydman & Jenter 2010: 4). A stock option is a contract that gives recipients rights to buy or to sell stock holdings at a fixed price on or before a given date. A stock option is a unique type of financial contracts, which only delivers rights but not obligations to recipients. It only has value when there is a positive variance on firm stock price. Generally, there are two types of options: call options and put options. A call option gives the owner rights to buy assets at a fixed price during a specific period. A put option is opposite to the call option, which gives the owner rights to sell assets at a fixed exercise price during a specific period. (Ross et al. 2008: 440.)

An option is valued as a firm opportunity cost of granting the options to employees rather than selling it in the open market. The Black-Scholes formula is generally used to value the price of it. However, employees will evaluate options differently from the firm, since they are risk-averse and risk-undiversified, and personally trading the option or hedging the risk by selling short may be forbidden. Firms consider the increment of executive performance exceeds the excessive costs that firms pay risk-averse executives risky options rather than cash compensations. Understanding how executives evaluate options is an important issue. (Conyon 2006: 26–28.)

A stock option provides a direct association of executive pay with firm share price appreciation since there is a dollar-for-dollar increment for the exercising option and the stock price. Stock options provide different incentives in comparison with equity ownerships for a few reasons. First, stock options are not rewarded for total shareholder returns including dividends but are only rewarded for stock price appreciations, thereby executives might be motivated to avoid dividends and to promote share repurchases. Second, stock price volatilities bring increments in option values, thence executives have incentives to engage in riskier investments. Finally, there will be a loss of incentives when the stock price declines sufficiently below the exercise price and the chance of exercising the options becomes small. (Murphy 1999: 18.)

3.2.2 Restricted stock grants

Restricted stocks are restricted in a sense that stock shares are forfeited under certain conditions which usually relate to employees' longevities. The forfeiture possibility allows favorable tax treatment and accounting treatment. In particular, executives do not pay taxes on restricted stock grants until the restrictions cease. Also, the costs are amortized over the vesting period and are recorded as the stock price of the grant-date even if the price has increased during the vesting period after the grant. Restricted stock plans are more common in producer firms rather than in consumer firms, and they are more common in R&D-intensive firms rather than in non-R&D firms. The vesting period is longer in producer firms than in consumer firms (Murphy 1999). Restricted stock grants replacing stock options become the most popular form of equity-based compensation by 2006, since the options expensing and the prior declines in the stock market leads to the reducing popularity of stock options. (Frydman & Jenter 2010: 6.)

Hall and Murphy (2003) find that incentives are maximized through restricted stock grants rather than options, when executives are offered equity-based compensation instead of equivalent cash compensation to obtain expected unchanged executive utilities. For providing incentives for top executives, restricted stock grants have several advantages over stock options. Restricted stock grants provide relatively more stable incentives whereas options will lose incentive values once the stock

price falls sufficiently below the exercise price. Firms that under constant pressures of granting additional options to replace underwater options and lowering the exercising price of outstanding options could avoid the problems by providing executives with restricted stocks. Restricted stock grants affect the risk-takings of executives and provide executives with incentives to pursue appropriate dividend policies in comparison with options that motivate executives to avoid dividends and to favor share repurchases. (Hall & Murphy 2003: 17–18.)

Fried and Bebchuk (2004) argue that restricted stocks tend to increase windfalls rather than to reduce them since restricted stocks seem to be a type of options. Restricted stocks using the grant date price as the strike price may provide executives with large gains from market or sector movements, even if the executives substantially underperform relative to industry peers. However, restricted stock awards can be superior to options since they are only possible to sell in a long period, supplying executive incentives to focus on long-term value and to avoid short-term gaming. (Fried & Bebchuk 2004: 173.)

3.2.3 Other forms of payouts

In addition to the five basic components of CEO compensation: base salaries, annual bonus plans, restricted option grants, restricted stock grants and long-term incentive plans, CEOs often receive other forms of benefits including defined-benefit pension plans, various perquisites, departure payments and severance payments. The rise of these forms of pay may be a result of insufficient disclosure and optimal contracting (Frydman & Jenter 2010: 6–7). As the classification of Cooper, Gulen & Rau (2009), all the other elements of executive pay besides the cash compensation are classified to the incentive compensation (Cooper, Gulen and Rau 2009: 10).

Many firms offer long-term incentive plans basing on annual performance, typically basing on rolling average three-year or five-year cumulative performances. The structure of a typical long-term incentive plan is similar to which of an annual bonus plan (Murphy 1999:23). Perks may be optimal if executive managerial productivity is enhanced or if the costs are low for the firm. (Rajan & Wulf 2006: 3). Perks are provided for executives in the forms of various goods and services, such as loans at

below-market interest rates, the personal uses of company aircraft and club memberships. Shareholders negatively react on CEO excessive perks, which reveals rent-extraction and weak corporate governance. Therefore, the reduction of firm value upon the revelation of perks exceeds the actual costs, and then the perk consumption is attested to be a reflection of a managerial excess and a firm value reduction (Frydman & Jenter 2010: 7; Yermack 2006a: 212). Nevertheless, some evidences show that perks help to enhance the productivity by motivating the most productive executives to save time. The extent to which perks are defined as an efficient mechanism remains to be an open question (Frydman & Jenter 2010: 7).

Pensions of defined benefits are the most unsecured and unfunded claims for the firm, which are justified as a form of inside debt to alleviate risk-shifting problems by aligning executive interests with unsecured creditors' interests (Frydman & Jenter 2010: 7). By having a pension plan, at the retirement the median actuarial value of it is corresponded to almost 34% of the CEO's total compensation over his tenure (Bebchuk & Jackson 2005: 824). Top executives are routinely offered supplemental retirement plans in addition to company-wide retirement programs. Various supplemental retirement plans such as defined-benefits plans based on credited years of services and variable-benefits plans based on firm performance are not eligible for tax purposes (Murphy 1999: 23).

Separation pays awarded to retiring or dismissed CEOs are common but usually moderate in values (Yermack 2006b: 255). Rusticus (2006) indicates that separation agreements are typically signed when CEOs are hired, and are equivalent to two-year cash compensations. A CEO receives a sufficient special severance payment if he loses his job as a consequence of the firm being acquired, which is called a golden parachute. The adoption of the golden parachute provision usually comes with positive stock market reaction. (Frydman & Jenter 2010: 8).

In addition, Fried & Bebchuk (2004) point out that executives obtain substantial other types of payouts from post-retirement perks, deferred compensations, loan arrangements and consulting fees. These forms of payouts are largely decoupled from performance. These generous payouts further boost the pay-without-

performance, thence firms continue failing to provide executives with incentives by these forms of pay.

4. FIRM PERFORMANCE

Various measurements are used to evaluate firm performance. The study of Merchant (2006) classifies performance measurement into three categories: accounting performance measurements, market performance measurements and combination performance measurements. Accounting performance measurements can be residual terms, such as operating profit, net income after tax, residual income and economic value added (EVATM), as well as ratio terms such as return on investment (ROI), return on equity (ROE) and return on net assets (RONA). Market performance measurements reflect changes in shareholder returns and movements of stock price. The combination measurements involve a combination of one or both of the accounting measures and market measures, as well as a combination of disaggregated financial measures (e.g. revenue, net income and expense) with non-financial measures (e.g. sales growth, inventory turnover and customer satisfaction).

Merchant (2006) describes a set of criteria for evaluating the executive performance measurements. For achieving an incentive purpose, a performance measurement will meet the following criteria: timeliness, accuracy, understandability, cost effectiveness, congruence with firm objectives, and controllability by executives. The research implies that all these performance measurements fail to satisfy one or more of the evaluation criteria hence lead to outcomes less than optimal, whereas some measures are better than others in specific situations.

4.1 Accounting performance measurements

As mentioned by Merchant (2006), executives in most corporations are rewarded basing on accounting performances. In the sample of 177 firms, Murphy (1999) finds that 161 firms of it use at least one accounting performance measure on their bonus plans design. Accounting performance measures can be classified into two categories: residual measures (e.g. net income, operating profit, residual income, and earnings before interest, taxes, depreciation and amortization) and ratio measures (e.g. RONA, ROI, ROE, and risk-adjusted return on capital). The measures are derived from the standard rules for the financial reporting purpose.

4.1.1 The pros of accounting performance measures

Various reasons are explained to the incremental using of accounting-based performance measurement in executive compensation contracts. The reason most commonly consented by the executives and compensation consultants is that accounting measures excluding factors that beyond executive controls. Gibbons and Murphy (1990b) survey the advantages of accounting-based incentives relative to stock market-based incentives, point out that more than half of the executive compensation providers addressing that “accounting plans are advantageous because stock prices are affected by market factors outside of management control” (Gibbons and Murphy 1990b: 11). Stock market performance is considered as a noisy measure which uncontrollable noises come from market-wide movements in the stock price.

Sloan (1993) investigates the relationship between accounting earnings and stock prices. The result demonstrates that accounting earnings are more sensitive to firm-specific movements in stock prices relative to market-wide movements in stock prices. This finding can be interpreted by that accounting earnings only reflect a subset of the value relevant events while do not reflect macroeconomic effects on stock prices. CEO basic salaries and bonuses are more sensitive to accounting earnings in firms where accounting earnings are more associated with firm-specific changes in firm values. Compared with market performance measures, accounting performance measures are less positively or negatively associated with market-wide movements in stock prices. The result suggests that accounting performance measures in top executive pay contracts could help shielding executives from market-wide firm value movements that beyond executive controls. (Sloan 1993: 58.)

Accounting performance measures are accountable for any level of managers, from CEOs to the lowest level managers. The rules of measuring accounting returns and accounting items in financial statements are clearly defined, thus the variance of the measurement is reduced. Besides, external auditors provide periodic checks on the objectivity of firm accounting reports, thence accounting performance measures are relatively objective and accurate. Moreover, accounting measures are understandable for each manager and they are required for the financial reporting purpose, thereby there is little incremental cost. (Merchant 2006: 901.)

4.1.2 The cons of accounting performance measures

Corresponding to the major advantage of accounting performance measures the major limitation of accounting performance measures is that they are not congruent with market value changes in numerous situations. The reasons could be that accounting profits focus on the past whereas market values are derived from future cash flows, thence past performance is not a reliable indicator for future performance. Also, different choices of measuring methods may deliver different accounting profits. For example, alternative inventory measures (First in First out versus Last in First out) and alternative depreciation measures based on different depreciation methods and different asset lives will deliver different accounting figures. Moreover, accounting measures have conservative biases, since accounting rules recognize gains and revenues slowly but recognize losses and expenses quickly. The recognition of revenues and profits is required to meet strict criteria, whereas the expenditures on intangible assets are usually quickly expensed and even not recognized in financial statements. Therefore, revenues and expenses are not matched well through accounting performance measures, especially in the situation that the measurement period is shorter than the investment payoff horizon. (Merchant 2006: 902–904).

Some value changes, for example, the immediately expensed investments in intangible assets such as human resources, customer goodwill, information systems, and research in progress, cannot be measured accurately and objectively, and even be ignored in accounting measurements. As to a number of firms, intangible assets play a more important role than the tangible assets of plant, equipment and land that only represent a small fraction of the firm total market value. Furthermore, accounting profits ignore the costs of investments in working capital even though these investments tied up with capitals have real economic costs. Besides, accounting profits reflect the costs of borrowed capital but ignore the costs of equity capital. This omission results in an overvaluation of the real profits—the excessive gap between returns on the capital and costs of the capital. In the meanwhile, accounting measures ignore risks and changes in risks to some extents. Cash flows are adjusted to be more certain and less risky, thence the economic value is increased while this change is not reflected in accounting measures. (Merchant 2006: 902–904).

The empirical test of Merchant (2006) on the congruence of accounting performance measures with stock market performance measures, implying that accounting profits are not reliable indicators for market value changes. Previous researches generally report quite low correlations (the range 0.1-0.3) between accounting profits and changes in market values. And the correlations are higher in firms with relatively high proportions of tangible assets relative to firms with relatively high proportions of intangible assets. Studies measuring the correlations over long horizons find that the correlation grows with the length of the measurement period. The correlation between accounting profits and market value changes for one, two, five, and ten years is 0.22, 0.39, 0.57, and 0.79 respectively, for the reason that accounting measures provide lagged indicators for economic values. However, the higher correlation over longer measurements periods does not suggest executives are rewarded for long-term performance since the faded timeliness of the pay contract will limit the motivational effects and it is difficult to set performance targets over the measurement period extended to the far future. (Merchant 2006: 903–904).

4.1.3 Updated accounting performance measures

In order to make up for the congruence failure of accounting performance measures, consulting firms propose a few of new improved accounting performance measures. These updated accounting measures include the economic profit, the total business return, the economic value added (EVATM), the shareholder value added (SVA) and the cash flow return on investment. These new measures are advised to be more closely correlated with firm value changes compared with traditional accounting measures and relative performance measures. (Merchant 2006: 904.)

The EVATM developed as an overall measure of accounting performance focuses on the creation of shareholder value. It defined as the accounting profit less a charge for capital employed is claimed to refine the inherent defects of accounting measures that may induce dysfunctional decision-making (Otley 1999: 371). Over 160 adjustments are added to the measurement. The most prominent adjustments contain the standardization of accounting policy and the capitalization and amortization of investments in intangible assets (Merchant 2006: 904).

Biddle et al. (1997) analyze correlations between market returns and accounting performance measures involving the EVATM, the net income, the residual income and cash flows from operations over one year and five years. They find that the measure most closely correlated with the market return is the net income, whereas significantly weak correlation is demonstrated for the EVATM. This finding is consistent with the result of Garvey and Milbourn (2000) which indicates that a relative poor congruence of the EVATM with market value.

Although it is possible that in some specific industries or settings, the EVATM measure has better congruence with market value, some limitations of accounting performance measures are still not made up by the EVATM. Because it still focuses on the past rather than the future while firm value changes are often caused by the changing future expectations. As the same as traditional accounting measures it is also the transaction orientated since gains are not recognized until a transaction occurs, and conservative bias still exists in this measure. Besides, it is commonly believed that managers do not completely understand the complex measures. Moreover, the implication of this measure is expensive as substantial assistances from consultants, management development and training time are required. (Merchant 2006: 904–906.)

Demsetz and Lehn (1985) use accounting profit rates to measure firm performance while all studies that followed this research use the Tobin's Q. The difference between the two measures represents in two aspects. The first difference comes from the time perspective. The accounting profit rate is a backward-looking evaluation measuring what executives have accomplished while the Tobin's Q is a forward-looking estimation measuring what executives will accomplish. The second difference arises from whom is measuring the performance. As to the accounting profit rate, performance is measured by accountants constrained by standards set by their profession whereas as to the Tobin Q, performance is measured by the investor community constrained by their wisdom, optimism or pessimism. (Demsetz & Villalonga 2001: 213.)

4.2 Market performance measurements

Market performance measures are based on the changes in firm market values or shareholder returns, providing indirect indications for the amounts of firm value that have been created or destroyed (Merchant 2006: 897–898). As stated by Bacidore et al. (1997: 11) “financial performance used in managerial compensation.... must be correlated highly with changes in shareholder wealth”. When executives create firm value, shareholders get paid. Market performance measures get executives paid as the same way as shareholders get paid and thus align the executive interests with shareholder interests. Market measures are available on a daily or even more frequent timely basis since market value changes are commonly measured using transaction prices, thence market values can be measured precisely and objectively. Moreover, market measures are less manipulable by executives whose performances are being evaluated in comparison with accounting performance measures. In addition, market measures are cost effective since measurement expenses are not required for the firm. (Merchant 2006: 898.)

In the meanwhile, market measures have some limitations. Market measures are only available for public traded firms. They are neither available for privately-held firms nor available for subsidiaries, divisions or non-for-profit organizations. Besides, market measures only provide indications for top executive performances because in general the market performance is only affected by the performances of the top five executives who have the positions of making the most important decisions in significant levels. Nevertheless, market measures cannot be totally controlled even by top executives since market prices are affected by various factors beyond executive controls, such as the interest rate, the factor price, the exchange rate, competitors’ actions and macroeconomic activities. In some situations, almost 98 percent of stock performances can be explained by macroeconomic factors and competitive factors. Another problem with market measures is that market values do not always reflect realized performance whereas future expectations heavily affect the market values. It is risky to pay executives based on expectations which might not be realized. At the same time, not any information executives know is disclosed to the market for reasons of competition and confidentiality. Therefore, market measures are not always well congruent with changes of the true intrinsic values of

the firm. In addition, executives can manipulate stock prices in short-run through the disclosure timing. Numerous anomalies of valuation have been found even in a market where participants are well informed. (Merchant 2006: 898–900.)

Gibbons and Murphy (1990a) find that executive compensation is more sensitive to firm-specific changes relative to market-wide changes in firm value. Therefore, the market performance measurements for pay contracts are not frequently used for a few of possible explanations. First, implementation costs are associated with market measures. Second, costs generated by adverse incentives are brought by the measurements. Third, accounting performance measures provide benefits except the limited role of risk-taking and the lack of congruence with the market movement. (Sloan 1993: 92.)

Merchant (2006) suggests that market measures can be improved to reflect more about controllable factors of performance through standard management accounting techniques such as a flexible budgeting, a variance analysis and a relative performance evaluations (RPE). The relative performance measure indicates that executives are held accountable for creating greater market returns compared with the whole market or the closest industry peers. Adjustments can also be made through adjusting the effects of specific uncontrollable factors such as the currency exchange movement, recession economy, customer bankruptcy and unforeseen acts of nature. (Merchant 2006: 901.) RPE implemented for measuring CEO performance is less expensive in comparison with which implemented for measuring performances of other executives since CEOs have limited interactions with CEOs in peer firms thence sabotage and collusive shirking are less possible. (Gibbon & Murphy 1990b: 2.)

Results of Gibbons and Murphy (1990b) also suggest that CEO pay is positively and significantly related to firm-specific performance, but is negatively and significantly related to industry and market performance. Another finding implies that the RPE is not associated with changes in shareholder wealth, lagged shareholder returns or firm accounting performance. Although the theory of RPE assumes that an optimal contract will shield a CEO from industry and market uncertainties, many components of CEO wealth are not shielded from industry and market fluctuations in firm value.

For instance, the value changes in stock options and inside stockholdings are solely dependent on the firm absolute stock market performance but are not dependent on the performance relative to the industry or market. Few firms adopt the explicit RPE compensation systems, which reasons could be the costs of switching to a new measurement system are above the potential benefits, and the side-effects of RPE in terms of sabotage, collusion and production of externalities. (Gibbon & Murphy 1990b: 32.)

4.3 Combination performance measurements

Another approach of measuring performance is the combination of measurements. The combination of stock market performance measures and accounting performance measures is a common type of combination measures. For example, in 2004 the CEO of General Electric (GE) was granted 250,000 shares with a market value of \$7.5 million. Half of the shares would be granted to him only if the GE's operating cash flow had annually risen by 10% during the period from 2003 to 2007, while the other half was granted only if total shareholder return meets or beats which of the S&P 500 in the simultaneous period. The second common type of combination measurements combines the summary accounting measures, specific disaggregated accounting elements (e.g. revenues, expenses, margins, assets and liabilities) and non-financial measures (e.g. product quality, customer satisfaction and yields). For example, a division executive's bonuses may be granted half basing on ROA and half basing on the sales growth. In recent years, a lot of combination systems have been developed and publicized, such as the balanced scorecard, the intellectual capital navigator and the performance prism. (Merchant 2006: 906.)

Combination performance measurements provide more complete reflections on performances that cannot be sufficiently reflected or weighted enough by a single performance measure. Combination measurements are also more flexible. Summary accounting measurements and market measurements weigh every dollar of inflows and outflows equally, thus valuable information can be neglect in the performance aggregation. Nevertheless, decomposed measures distinctly weigh the importance of different financial elements. For example, controlling general and administrative expenses can be assigned more importance compared with controlling raw material

costs, and revenues of new products can be more weighted than revenues of old products. In firms with large proportions of intangible assets, accounting measurements cannot efficiently reflect the value creation, whereas additional non-financial values driven measurements can improve management decision-makings. Compared with accounting measurements that only reflect the interests of firm owners and financial claimants, combination measurements reflect interests of more stakeholders such as employees, customers, suppliers, governments and the society at large. (Merchant 2006: 906-907).

Combination measurements can make up the backward-looking and the short-term orientation limitations of accounting measurements. The short-term orientation can be balanced with other future-oriented measures like market measurements which are driven by the estimation of future cash flows and non-financial performances such as product quality, customer satisfaction, and new product development which are also future-oriented. Moreover, accounting measurements supplemented with value-driven measurements can help to avoid executives pursuing short-term performance at the cost of future profitability. The balanced scorecard (BSC) system is desired to complements the lagged accounting performance measurements with future-driven measurements and non-financial measurements. The balancing of the short-term concern and the long-term concern makes the performance measurements timelier. The BSC system also attempts to provide information required in a feed-forward control system by alerting executive behaviors before problems occurring. (Kaplan & Norton 1996: 8; Merchant 2006: 906–907.)

The BSC system is developed by Kaplan and Norton in the 1990s. It is a multi-dimensional performance measurement and management control approach. It suggests that besides financial performance measures, non-financial performance measures related to customers, business processes and longer-term sustainability are also required being paid attention to. The four dimensions of performance in the BSC system are financial, customer, internal business, as well as innovation and leanings dimensions. For each dimension, up to four measures are suggested. These performance measures are suggested to represent the critical success factors which are necessary for continued organizational survival and/or success. (Otley 1999: 374.)

Kaplan and Norton (1996: 10) point out that the measurements of the BSC are derived from a top-down process driven by the mission and strategy of the organization. It is not just a collection of financial and non-financial performance measures. Three balances are embedded in the BSC system: the balance between external measures for shareholders and customers, and internal measures of critical business processes, innovation and learning; the balance between past outcome measures and the future driven measures; the balance between the objective and easily quantified outcome measures, and the subjective and judgmental performance drivers. Ittner et.al (2003) argue that little direction is provided by Kaplan and Norton (1996) on how to balance or combine these disparate performance measures. Objective performance measurements for executive pay contract designs, which derived from the BSC system is expected to be “easier and more defensible to administrator.... and also less susceptible to the game playing”. (Ittner et.al 2003: 728.)

As the result of Merchant (2006) indicated, none of the measurement systems is perfect, studies on the advantages and disadvantages of performance measurements are still required. The major limitation of the market measurements is the controllability since market measures are affected by factors beyond executive controls. The primary limitation of accounting measurements is the congruence—accounting measures are not highly congruent with value changes even with some adjustments suggested by consulting firms. As to the combination measurements, there is no empirical evidence demonstrates that combination measurements are highly congruent with value changes in any particular design. Also it is difficult to evaluate combination measurements in a broad generalization since the variance of combination measurements is large. Further, there is no explicit guidance on how to build combination measurement systems. For instance, right value drivers are untested, knowledge on measuring various performance qualities and weighting the importance of each measure of the combinations are limited. There is a space to refine and deepen the implementations of the complex combination performance measurements. (Merchant 2006: 910–911.)

4.4 CEO pay and firm performance

An interpretation for any causal relationship of the observed correlation between executive pay and firm performance is extraordinarily difficult. A number of cautions lead to the correlations between CEO pay and firm performance. Frydman and Jensen (2010) suggest that a comprehensive measure for measuring the incentive effect of CEO pay should consider all possible effects of firm performance on CEO wealth: the effects of firm performance on CEO current and future compensation, the effects of firm performance on the value of CEO inside stockholdings, and the effects of firm performance on the CEO non-firm-specific personal wealth.

4.4.1 CEO pay for firm performance

Jensen and Murphy (1990b) firstly investigate most effects of firm performance on CEO wealth at the context of large public US firms. They report that only \$3.25 of CEO pay rise for every \$1,000 growth in firm value, thence they deduce that in US, CEOs are paid like “bureaucrats”. (Frydman & Jenter 2010: 10.)

The estimate of Jensen and Murphy (1990b) is disputed in the following researches on economic basis and theoretic basis. Hall and Liebman (1998) claim that even the pay-performance sensitivity is low, a modest movement in firm value will bring a large variation to the executive pay since $\beta \Delta V$ could be large for sufficient ΔV even if β is small. Haubrich (1994) argues that the low pay-performance sensitivity consists with the agency theory, and the sensitivity can be affected by factors such as firm volatility, firm size and intensified interests' conflict between executives and shareholders. The result of Murphy (1999) indicates that pay-performance sensitivity practically doubled to 0.6% by 1996 relative to the result of Jensen and Murphy (1990b). A large gap is remained between executive interests and shareholder interests as a result of the low pay-performance sensitivity. (Murphy 1999: 35–36.)

Jensen and Murphy (1990b) report a small positive but significant relationship between CEO cash compensation and firm performance with a coefficient of 0.0000135 suggesting a CEO receives additional 1.35¢ for each \$1,000 increase in shareholder wealth. The significance of this estimated coefficient is low. This result

consists with the results of studies such as Murphy (1985), Coughlan and Schmidt (1985), and Gibbons and Murphy (1990) who also report that one percent increase in CEO cash compensation for every ten percent increase in firm value. These studies indicate low pay-performance elasticity (approximately 0.1). After converting the pay-performance elasticity into absolute dollars, the low coefficient is still consistent with the finding that there is a weak relationship between CEO cash compensation and shareholder wealth (Jensen & Murphy 1990b: 230). Fried and Bebchuk (2004) find out that firms continue failing to provide executives with incentives by the non-equity-based pay. However, the weak linkage between the non-equity-based pay and firm performance is evitable since it is easily to reward executives for prior performance. (Fried and Bebchuk 2004: 151.)

Baker, Jensen and Murphy (1988: 19) find that incentives generated by cash compensation are trivial in comparison with incentives generated by equity-based-compensations and inside stockholdings. Sigler and Harley (1995: 31) also suggest that incentive compensations such as stock options and restricted stocks solve the agent problem by tying executive wealth to shareholder wealth. The result of Hall and Liebman (1998) indicates that the executive pay and firm performance have been tied increasingly closer from 1980 to 1994, mainly due to the rise of stock options. The median pay-performance elasticity rises from 1.2 in 1980 to 3.9 in 1994. The elasticity of 1994 is approximately 30 times of which in 1980. The elasticity reported by Hall and Liebman (1998) is much larger relative to which of previous researches ignoring the value changes of stock options and inside stockholdings. Thence, Hall and Liebman (1998) suggest that executive equity-based pay primarily drives almost all of this elasticity. In particular, for a given change in firm value, the change of CEO pay due to the rise of the equity-based compensation is more than 50 times overweigh which due to the rise of cash compensation (Hall and Liebman 1998: 655).

Murphy (1999: 34) also reports an increasing trend of pay-performance sensitivity and finds that in the manufacturing industry, the estimated pay-performance sensitivity is affected 64% by stock options and 31% by stock ownership. The sensitivity is not significant for cash compensation and long-term incentive plans since the magnitude of the changes in these pay components is small in comparison with which in the values of options and stockholdings. In addition, Murphy (1999)

points out that pay-performance sensitivity is almost exclusively driven by stock option grants.

Besides, Fried and Bebchuk (2004) argue that the non-equity-based pay as well as equity-based pay is weakly connected to firm performance. Substantial other types of pay for executives such as pensions, postretirement perks, deferred compensation, loan arrangements, consulting fees and severance, are largely decoupled from performance, thence the pay-without-performance is further boosted (Fried & Bebchuk 2004: 151–173).

Aggarwal and Samwick (1999) suggest that executive pay should not only base on the performance of their own firm but also should base on the performance of their peer firms in the same industry. They indicate that an executive will receive a lower pay if executives in peer firms deliver better performance. A short-term pay confirms to the relative performance evaluation whereas a long-term pay shows an opposite result. Janakiraman, Lambert, and Larcker (1992) find that executive pay increases with industry accounting performance whereas decreases with industry stock market performance. Nevertheless, Jensen and Murphy (1990b) point out that relative performance is not an important measurement for measuring executive incentives. Aggarwal and Samwick (1999) investigate the effect of the stock return variance on the pay-performance sensitivity. They find that riskier firms have lower pay-performance sensitivities, and if the effect of the variance is omitted, pay-performance sensitivity will be underestimated. This finding substantially supports the principal-agent model. However, Core and Guay (2001: 2) argue that the pay-performance sensitivity is significantly positively related to the firm risk while the firm risk is not the sole determinant of the executive pay-performance sensitivity.

Jensen and Murphy (1990b: 154–164) suggest that no matter in which level the CEO pay is related to the firm performance, it has limited function on providing incentives to align CEO interests with the shareholder interests. How the CEOs are paid overweighs how much the CEOs are paid.

4.4.2 CEO ownership for firm performance

CEO compensation and stock ownership remain the most effective tools of aligning CEO interests with shareholder interests. Unless CEO pay and performance are virtually linked, firms and shareholders will suffer from poor performance (Jensen & Murphy 1990a: 149). The pay-performance sensitivity is primarily driven by stockholdings and stock options rather than by any other components of compensation (Murphy 1999: 34).

Regarding the relationship between CEO ownership and firm value, two perspectives are considered. A positive relationship is predicted from the view of interests' alignment, whereas a non-monotonic relationship is posited from the view of the costs of stock ownerships. Several studies find a non-linear relationship between executive ownership and firm performance (e.g. Griffith 1999, Mc-Connell and Servaes 1990, and Morck et al. 1988) while the level of entrenchment effect is not clearly identified. (Sundaramurthy et al. 2005: 496.)

Jensen and Murphy (1990b: 238) investigate the effect of changes in shareholder wealth on the changes in CEO firm-specific wealth. They find that when CEO inside shareholdings are involved in CEO wealth, the coefficient 0.00149 much outweighs the coefficient 0.000307 when CEO inside shareholdings are not considered. Therefore, they suggest that CEO ownership plays an important role in providing incentives for CEOs. Then they examine the effect of CEO fractional ownership on the pay-performance sensitivity and deliver a positive and significant coefficient $\beta = 0.000366 + 1.02 * (\text{fractional ownership})$. When using the median level ownership 0.16%, the coefficient is 0.002 which indicates that CEO firm-specific wealth increase (or decrease) \$2.0 whenever shareholder wealth increase (or decrease) \$1,000. (Jensen and Murphy 1990b: 239.)

Mehran (1995: 164) investigates the pay-performance relationship by using both measures of ROA and Tobin's Q, and finds that the pay-for-performance relationship is positively related to the percentage of executive equity-based compensation in executive total pay, as well as is positively related to executive fractional ownerships. However, Sanders (1999: 61) analyses the effect of CEO ownership on pay-

performance relationship in comparison with the effect of stock options. The result suggests that CEO stock ownership positively affect the pay-performance relationship, whereas the stock options impose a negative effect on the pay-for-performance.

Morck, Shleifer, and Vishny (1988: 311-312) find that Tobin's Q increases when executive ownership rises from 0% to 5% whereas it declines when ownership further rises to 25% and then Tobin's Q appears to rise afterwards although much more slowly. The increment of Tobin's Q with the increment of executive ownership indicates a convergence between executive interests with shareholder interests, whereas the following decline reflects the executive entrenchment. The study points out that it is plausible that when the fractional ownership is beyond the range 25%-30%, additional entrenchment effects tend to be minimal. McConnell and Servaes (1990: 595) re-examine the relationship between executive fractional ownership and Tobin's Q. They find a significant curvilinear relationship that the curve slope moves upward until executive ownership reaches the range between approximately 40% and 50%, and then the slope moves downward slightly. Griffith (1999) finds that CEO fractional ownership has a dominant effect on generating incentives to create firm value while the relationship between CEO fractional ownership and Tobin's Q is non-monotonic. When CEO fractional ownership is at a low level range between 0% and 15% Tobin's Q grows, whereas when CEO ownership increases to the majority level 50% Tobin's Q starts to decrease, then Tobin's Q begins to rise again when CEO ownership is beyond 50%. This result implies that with a low level of ownership, a CEO is forced to maximize shareholder wealth through various forms of market discipline, while when the CEO obtains enough controls he becomes self-indulgent. (Griffith 1999: 1 & 7.)

Ofek and Yermack (2000) examine the effect of equity-based compensation (stock options and restricted stocks) on the executive ownership. They find that equity compensation provides more incentives for executives with lower levels of ownerships, whereas it fails to supply incentives for executives with high levels of ownerships since the executives will reduce risk exposures by selling previously owned stock shares. Himmelberg, Hubbard and Palia (1999: 381) claim that the endogeneity induced by the unobserved time-invariant heterogeneity is ignored by

previous studies. If both of the endogeneity and the heterogeneity are controlled, the effect of executive ownerships will be difficult to conclude.

5. EMPIRICAL RESEARCH DATA AND METHODOLOGY

The empirical research part of this study starts with introducing the data source, the data sample conduction and the descriptive statistics. And then it describes the quantitative research approach: the first-difference pay-performance sensitivity by using pooled OLS regression for the examination.

5.1 Empirical research data

The empirical examination is based on two sets of observations: the data of CEO compensation and the data of firm financial information. Both sets of data are retrieved from Standard & Poor's Compustat ExecuComp database which contains the comprehensive top executive compensation data and corresponding corporate financial information data for the S&P 1500 Index firms. The two sets of observations are matched and then observations are removed if any raw data is missing either from CEO compensation or from firm financial information. Data belongs to the bank, insurance and real estate corporations (SIC codes 6000-6799) is excluded because the accounting observations of these firms are not comparable with which of firms in other industries. In order to make data distribution more normal for regression analyses each variable is trimmed at 1% level, which implies that observations that beyond the distribution range from 1% to 99% are deleted for each variable. After eliminating observations with missing raw data and deleting outliers, the final sample set consists of 1,336 yearly "first-differences" in CEO compensation as well as in firm financial performance constructed on 718 CEOs from 711 firms during the period from 2008 to 2012. All monetary-variables are adjusted for inflation by dividing the consumer price index for the closing month of the fiscal year.

Table 1 Descriptive statistics on CEO pay and firm performance

Variables	Mean	Median	Standard deviation	Min	Max
CEO cash compensation, [\$ thousands]	870.323	775.887	961.071	0.000	31,000.000
CEO incentive compensation, [\$thousands]	3,095.331	2,022.293	3,387.887	0.000	37,422.211
CEO total compensation, [thousands]	3,965.654	2,821.211	3,909.793	0.000	68,422.211
CEO fractional ownership, [%]	4.275	2.110	6.726	0.022	69.100
Value of CEO stockholdings, [\$ mill]	55.469	22.557	179.846	0.104	4,721.539
Value of shareholder wealth, [\$ mill]	2,442.032	938.864	4,360.496	5.924	44,930.766
Firm ROA, [%]	2.989	4.740	11.261	-76.992	45.880

Table 1 reports descriptive statistics on CEO pay and firm performance of the inflation adjusted sample during the period from 2008 to 2012. Cash compensation (TCC) includes base salaries and bonuses. Total compensation obtained from Execucomp (TDC1) contains basic salaries, bonuses, options granted, restricted stock grants, payouts from long term incentive plans, and other components of pay. Incentive compensation is the difference between total compensation and cash compensation (TDC1-TCC), which includes options granted, restricted stock grants, long-term incentive payouts and other forms of pay.

The mean cash compensation \$870 thousands and the mean incentive compensation \$3,095 thousands are relatively larger than their corresponding median values \$776 thousands and \$2,022 thousands respectively. It indicates that the distributions of CEO cash compensation and CEO incentive compensation are skewed to the right sides, implying that many CEOs in the sample receive relative larger compensations than the CEO on average. The positive skewnesses of CEO compensation distributions might due to the higher levels of CEO pay in large firms. Compared with the descriptive statistics of Elo (2011)'s study which sample is based on the US top five executives' compensation and firm performance data over the period 2000-2007, the mean value of CEO total compensation over the period 2008-2012

decreases from \$5,392 thousands to \$3,966 thousands. Also, the positively skewed distributions of CEO fractional ownership and inside stockholdings, and the above 69% maximum CEO fractional ownership indicate that there are some quite large CEO fractional ownerships in the sample. Compared with the report of Elo (2011), the median fractional ownership has a remarkable increment from 0.51% to 2.11% from the period 2000-2007 to the period 2008-2012, while the mean inside stockholdings rises from \$23.046 million to \$55.469 million. As to firm performances, firm value is skewed to the right side, whereas firm ROA is skewed to the left side. In addition, relative to the sample of Elo (2011), the mean value of firm value shrinks from \$11,897 to \$2,442 million while the mean value of firm ROA shrinks from 6.69% to 2.99%, which reflects the weak condition of the economy.

5.2 Empirical research methodology

Jensen and Murphy (1990b) define the pay-performance sensitivity as a dollar change in CEO pay for a dollar change in firm value. According to Murphy (1999) the primary advantage of the sensitivity approach is that it provides more observable and understandable economic interpretations. The pay-performance sensitivity represents the incentives provided for executives to improve firm performances and to create shareholder values. Another advantage of the sensitivity approach is that it can be used to test the pay-performance relationship for the combination of CEO total compensation and CEO inside stockholdings, which supplies a comprehensive measure on how the CEO firm-specific wealth varies with firm performance. However, an elasticity approach defined as a percentage change in executive pay for a percentage change in firm value will require unavailable information on CEO non-firm-specific personal wealth.

A pooled ordinary least square regression is used to test the pay-performance sensitivity. According to the previous studies (e.g. Jensen & Murphy 1990, Hall & Liebman 1998, and Murphy 1999), the year-to-year pay-performance is typically modeled as:

$$(CEO\ PAY)_{it} = \alpha_i t + \beta_i (PERF) + \gamma_i \quad (1)$$

where γ_i is a CEO-specific or firm-specific effect that varies across CEOs but does not vary over time. α_i is a CEO-specific or firm-specific time trend. β is a corresponding vector of a coefficient. PERF is a vector of the contemporaneous performance measure.

Even though the above model could be estimated directly for each CEO, long time series are required in most cases (Murphy 1999). Therefore, time trends and pay-performance relations are assumed constant across CEOs by most researches ($\alpha_i = \alpha$, $\beta_i = \beta$). Fixed-effects or first-differences are used for emphasizing the changes of CEO compensation and firm performance. Thereafter, the following equation is developed:

$$\Delta(\text{CEO PAY})_{it} = \alpha + \beta \Delta(\text{PERF})_{it} + \varepsilon_{it} \quad (2)$$

where $\Delta(\text{CEO PAY})_{it}$ is CEO pay measured in the first-difference in year t . $\Delta(\text{PERF})_{it}$ is firm performance measured in the first-difference in year t .

The effect of lagged firm performance on CEO pay is explored by researches (e.g. Jensen & Murphy 1990b, Joskow & Rose 1994, and Boschen & Smith 1995) which find mixed results on the significances of the small coefficients for lagged firm performance (Murphy 1999: 32). Therefore, this study examines the effect of firm one-year lagged performance on CEO pay by implementing the following equation:

$$\Delta(\text{CEO PAY})_{it} = \alpha + \beta_1 \Delta(\text{PERF})_{it} + \beta_2 \Delta(\text{PERF})_{it-1} + \varepsilon_{it} \quad (3)$$

where the CEO PAY indicates cash compensation, incentive compensation, total compensation and the combination of total compensation with inside stockholdings. Total cash compensation (CASH COMP) refers to base salaries and bonuses. Total compensation (TOTAL COMP) contains basic salaries, bonuses, options granted, restricted stock grants, payouts from long-term incentive plans and other forms of pay. Incentive compensation (INCENT COMP) is the difference between total compensation and cash compensation. The classification of CEO pay follows the study of Cooper et al. (2009). The change in the value of CEO inside stockholdings

$\Delta(\text{INSIDE STKH})_{it}$ is taken into account in the term of CEO-specific wealth, which is calculated as the value of CEO inside shareholdings of the previous fiscal year (calculated as total common shares owned by the CEO multiplied by the close stock price in the previous fiscal year) multiplies one-year shareholder total return rate. Firm performance (PERF) involves both accounting performance measurement (ROA) and stock market performance measurement shareholder wealth (SHW) as what implemented by Joskow and Rose (2004). CEO pay and firm performance are all measured in first-differences in year t . The accounting performance ROA is calculated as net income divided by the total assets of the same fiscal year as which adopted by Mehran (1995) and Kato & Kubo (2006). The change of shareholder wealth follows the calculation method of Jensen and Murphy (1990b), which is calculated as $r_t V_{t-1}$. r_t is the year return rate of firm common stock shares realized by shareholders and V_{t-1} is the firm market value at the end of the previous year. Therefore, the effects of firm accounting performance and market performance on CEO cash compensation, incentive compensation, total compensation and the combination of total compensation with stockholdings are tested.

6 EMPIRICAL RESEARCH RESULTS

Empirical study results are presented interpreted and compared with which of the previous studies in this section. Sensitivities between CEO pay in first-differences and firm performance in first-differences are investigated by using pooled OLS regressions according to Equation 2 and 3. The effects of contemporaneous and lagged firm accounting performances (changes in ROA) and the effects of contemporaneous and lagged firm stock market performances (changes in shareholder wealth) on CEO pay are examined separately. Furthermore, CEO inside stockholdings is taken into account in the term of CEO firm-specific wealth. Sensitivities between CEO firm-specific wealth and firm performances are examined. At the same time, the effect of CEO fractional ownership is invested as an interaction term.

6.1 Sensitivities between CEO pay and firm performance

In Table 2 and Table 3, the dependent variables adopted in the tests are the CEO cash compensation, incentive compensation and total compensation in first-differences. The independent variables adopted are the current and one-year lagged accounting performance ROA in first-differences and the current and one-year lagged market performance shareholder wealth in first-differences, which results are presented in Table 2 and Table 3 respectively. On the first two tables, the coefficients of columns (1), (3) and (5) are the results for contemporaneous performance, while the coefficients of columns (2), (4) and (6) are results for both of contemporaneous and one-year lagged performances.

Table 2 CEO pay-performance sensitivities between CEO pay and firm accounting performance.

Independent Variables	Dependent Variables (in 1,00s of 2012-constant dollars)					
	$\Delta(\text{CASH COMP})_{it}$		$\Delta(\text{INCENT COMP})_{it}$		$\Delta(\text{TOTAL COMP})_{it}$	
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	12.260***	12.340***	67.707**	73.582*	81.967***	85.922***
$\Delta(\text{ROA})_{it}$	0.550291*	0.581806*	6.334338*	7.863192***	6.884678*	8.444993***
	(2.26)	(2.27)	(2.84)	(3.37)	(3.06)	(3.58)
$\Delta(\text{ROA})_{it-1}$		0.118742		5.761103*		5.879844*
		(0.4)		(2.15)		(2.17)
Adjusted R ²	0.0031	0.0024	0.0053	0.0080	0.0062	0.0090
Pay-performance sensitivity β	0.550291*	0.581806*	6.334338*	13.624295***	6.884679*	14.324837**
F-statistic for β	5.085	2.623	8.078	6.357	9.338	7.034

Note: t-values in parentheses, ***, **, * and † represent significant at 0.1%, 1%, 5% and 10% levels respectively.

In column (1) and (3) of Table 2, $\beta=0.550291$ and $\beta=0.334338$ are statistically significant at 5% level, suggesting a CEO receives average additional \$550.29 of cash compensation and \$ 6,334 of incentive compensation for each one percentage change in firm ROA. The coefficient in column (5) indicates that a CEO receives an average increase \$ 81,967 of the total pay in years when there is a zero change in firm ROA while he receives a sum of additional \$6,885 for each one percentage change in firm ROA. Elo (2011) studies on the pay-performance sensitivities between firm top five executives' pay and firm accounting and market performances over the period 2000-2007, which result indicates a change of \$9,099 in executive cash pay for each one percentage change in ROA and a change of \$48,280 in executive total pay for each one percentage change in ROA. Compared with the prior result, the smaller sensitivity found by this study implies that in a weak economy the pay-performance linkage of CEO pay with accounting performance is shifted to be loose.

When the change of firm one-year lagged ROA is added into the test as an

independent variable, column (2), (4) and (6) report coefficients allowing current compensation revisions basing on both the current and lagged firm accounting performances. In column (4) and (6), the coefficients for performances of year t-1 are positive and statistically significant, indicating that the last year's firm accounting performance does matter in the revision of this year's incentive compensation. Although bonus plans are assumed to be explicitly tied to accounting profitability by previous studies, the insignificant sensitivity between CEO cash compensation and firm lagged accounting performance could be explained by that in a weak economy period, the function of CEO base salaries as a fixed component of the pay contract for insuring livelihood, guaranteeing financial stability, as well as diluting risks that beyond executive controls tends to be more remarkable (Murphy 1999: 9-10, Veliyath 1999: 124). The sum of coefficients in column (4) of Table 2 implies that the value of CEO incentive compensation increases an average of \$13,624.30 for each one percentage increment in ROA. Therefore, the incentive generated by incentives compensation is larger relative to which generated by cash compensation—\$581.81 increment of cash compensation for each one percentage increment in ROA.

The sum of the coefficients $\beta = \beta_1 + \beta_2 = 14.324837$ in column (6) of Table 2 suggests that a CEO receives a total revision of \$14.33 for one percentage increment in ROA. The sum of the pay-performance sensitivity $\beta = 14.324837$ for total compensation is much smaller in comparison with the corresponding result $\beta = 81.128788$ of Elo (2011), which is mainly driven by the looser linkage of CEO cash compensation with firm accounting performance. It is also likely to be explained by the more notable ensuring function of base salaries. This result consists with the finding of Matolcsy (2000) which investigates the relationship between executive cash compensation and corporate accounting performance basing on a sample of Australian firms, and a weak relationship between executive cash pay and firm accounting performance in an economic downturn is found.

Table 3 CEO pay-performance sensitivities between CEO pay and firm market performance.

Dependent Variables (in 1,00s of 2012-constant dollars)						
Independent Variables	$\Delta(\text{CASH COMP})_{it}$		$\Delta(\text{INCENT COMP})_{it}$		$\Delta(\text{TOTAL COMP})_{it}$	
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	11.770***	11.339***	62.715**	43.141†	74.485*	54.480*
$\Delta(\text{SHW})_{it}$	0.000003 (0.66)	0.000003 (0.61)	0.000179*** (3.77)	0.000167*** (3.56)	0.000183*** (3.80)	0.000170*** (3.61)
$\Delta(\text{SHW})_{it-1}$		0.000006 (1.28)		0.000286*** (6.46)		0.000292** (6.53)
Adjusted R ²	0.0031	0.0024	0.0053	0.0080	0.0062	0.0090
Pay-performance sensitivity β	0.000003	0.000003	0.000179***	0.000453***	0.000183*	0.000462***
F-statistic for β	0.435	1.030	14.219	28.177	14.443	28.757

Note: t-values in parentheses, ***, **, * and † represent significant at 0.1%, 1%, 5% and 10% levels respectively.

Table 3 reports CEO pay-performance sensitivities by using stock market performance measurements. The coefficient in column (1) is low in magnitude ($\beta = 0.000003$) and statistically insignificant, which indicates that CEO cash compensation does not tie to shareholder wealth in the weak economy. The result implies that in a weak economy, bonuses are not dependent on stock market performance and base salaries extraordinarily represent the ‘fixed component’ in the executive contract for insuring livelihood, guaranteeing financial stability as well as diluting risks that beyond executive controls (Murphy 1999: 9; Veliyath 1999: 124). The coefficients in column (3) and (5) $\beta = 0.000179$ and $\beta = 0.000183$ are both statistically significant at 0.1 percent level, suggesting a positive relationship between the change in CEO incentive compensation and the change in firm value—a CEO receives additional incentive compensation 17.9¢ for each \$ 1,000 increase in shareholder wealth and receives additional total compensation 18.3¢ for each \$ 1,000 increase in shareholder wealth.

When the change of one-year lagged shareholder wealth is controlled in the test for CEO cash compensation, it is found that CEO cash compensation does not associate

with lagged shareholder wealth. It may also be explained by that the ensuring function of base salaries is more evident and bonuses are based more on firm accounting performance rather than stock market performance over this weak economy period (Murphy 1999: 32). The sums of the coefficients $\beta = 0.000453$ and $\beta = 0.000462$ in column (4) and (6) imply that a CEO's incentive compensation changes by 45.3¢ for each \$1,000 change in shareholder wealth and his total compensation changes by 46.2¢ for each \$1,000 change in shareholder wealth. The results are larger in comparison with which of Jensen and Murphy (1990b) and Elo (2011) that suggest a change of 30¢ for each \$1,000 change in shareholder wealth and a change of 7.8¢ for each \$1,000 change in shareholder wealth respectively. This sensitivity increment is mainly driven by the closer linkage of CEO incentive compensation with firm stock market performance, which implies that in a period with weak economic metrics, incentive compensation is more often used to provide CEOs with incentives to improve firm values. When the lagged performance is added into the test for CEO incentive compensation, coefficients are small but more significant relative to previous results of Jensen & Murphy (1990b), Joskow & Rose (1994) and Boschen & Smith (1995) that suggest mixed and generally insignificant coefficients for prior lags. This result indicates that in a recession and slow recovery period with weak economic metrics, CEO pay is more significantly associated with prior performances.

To sum up, in comparison with the results of Jensen & Murphy (1990b) and Elo (2011), the smaller and insignificant sensitivities between CEO cash compensation and firm performances suggest a more remarkable function of base salaries for insuring livelihood and guaranteeing financial stability in a weak economy (Murphy 1999: 9-10, Veliyath 1999: 124). Compared with the prior results, the lower sensitivity between CEO total compensation and firm accounting performance mainly driven by the looser linkage of CEO cash pay with firm accounting performance indicating that in a weak economy smaller pay-performance incentive is provided by CEO cash compensation. This result consists with the finding of Matolcsy (2000) which finds a weak or zero relationship between executive cash pay and firm accounting performance in an economic downturn. The positive and significant sensitivity between CEO total compensation and firm stock market performance is larger relative to previous results, which implies that CEO incentive

compensation is more frequently used to provide incentives for a CEO to improve firm value in a weak economy. In addition, when the lagged performance is considered into the test for incentive compensation, coefficients are more significant in comparison with the previous mixed and insignificant results, suggesting that CEO incentive compensation is more significantly associated with prior performances in a weak economy. Moreover, the result of this study also implies that CEO incentive compensation is closer tied to firm performance than CEO cash compensation is.

6.2 Sensitivities between CEO firm-specific wealth and firm performance

CEO inside stockholdings is another way that directly links CEO wealth to shareholder wealth independent of any link of CEO compensations with firm performances. In this section, the sensitivities between CEO firm-specific wealth and firm performance are investigated. The change of CEO inside shareholdings is taken into account in the term of CEO firm-specific wealth which is the dependent variable in the tests. In Table 4 independent variables adopted in the tests are the current and lagged accounting performances ROA in first-differences, while in Table 5 the independent variables are current and lagged stock market performances shareholder wealth in first-differences. In addition, the effect of CEO fractional ownership on the pay-performance sensitivity is investigated as an interaction term. (Jensen & Murphy 1990b: 13; Elo 2011: 75).

Table 4 CEO pay-performance sensitivities between CEO firm-specific wealth and firm accounting performance.

Independent Variables	Dependent Variables (in 1,000s of 2012-constant dollars)	
	$\Delta(\text{TOTAL COMP})_{it} + \Delta(\text{INSIDE STKH})_{it}$	
	(1)	(2)
Intercept	-290.415	-33.089
$\Delta(\text{ROA})_{it}$	324.325147*** (7.87)	-28.510695 † (-1.67)
$\Delta(\text{ROA})_{it-1}$	57.579821 (1.22)	-10.717995 (-0.56)
<i>(CEO Fractional ownership)_{it}</i> *		0.949118***
$\Delta(\text{SHW})_{it}$		(83.10)
Adjusted R ²	0.0441	0.8453
Pay-performance sensitivity β	324.325147***	-28.490669***
F-statistics for β	31.766	2432.935

Note: t-values in parentheses, ***, **, * and † represent significant at 0.1%, 1%, 5% and 10% levels respectively.

As indicated by Jensen & Murphy (1990b), the regression specification in column (6) of Table 2 assumes that the pay-performance sensitivity is the same for all CEOs regardless of their fractional ownerships, but it is plausible that β for the sensitivity between CEO firm-specific wealth and firm performance is small and even negative for CEOs with large stock ownerships since CEO wealth is tied too closely to the firm performance, whereas β may be large and positive for CEOs with inappreciable ownerships. The heterogeneity is tested by involving an interaction term $(\text{CEO Fractional ownership}) * \Delta(\text{SHW})$ in the test for capturing the effect of CEO fractional ownership on the pay-performance sensitivity (Jensen & Murphy 1990b: 13).

In column (2) of Table 4 which dependent variable is the combination of the change in total compensation and the change in inside stockholdings, the coefficient for current accounting performance and lagged accounting performance is significant in a low level and insignificant respectively, whereas the coefficient for the fractional ownership interaction variable is positive and highly significant. This result implies

that the relationship between CEO total firm-specific wealth and firm accounting performance is affected by the CEO fractional ownership. This result consists with the theory that an optimal compensation contract will be dependent on the CEO equity ownership (Jensen & Murphy 1990b: 14). When the CEO fractional ownership is controlled as an interaction variable, the sum of the pay-performance sensitivities is $\beta = -28.510695 + 0.949 * (\text{fractional ownership})$. Therefore, for a CEO with no stock ownership, his firm-specific wealth decreases \$ 28,511 for each one percentage change in firm ROA. When the median CEO fractional ownership 2.11% figured in this equation, the total pay-performance sensitivity $\beta = -28.490669$ suggesting a decrease of \$28,490.67 in CEO firm-specific wealth for each one percentage increase in firm ROA. This result is different from the corresponding result of Elo (2011) $\beta = 142.436384$ suggesting an increase of \$142, 463.84 in CEO pay for each 1 percentage increase in firm ROA. This difference might be explained by that the increase in firm accounting performance cannot have enough positive effects on stock market performance or have positive effects on the values of CEO inside stockholdings and CEO firm-specific wealth in the weak economy.

Table 5 CEOs pay-performance sensitivities between CEO firm-specific wealth and firm market performance.

Independent Variables	Dependent Variables (in 1,000s of 2012-constant dollars)	
	$\Delta(\text{TOTAL COMP})_{it} + \Delta(\text{INSIDE STKH})_{it}$	
	(1)	(2)
Intercept	-682.625†	-80.502
$\Delta(\text{SHW})_{it}$	0.018140*** (25.91)	0.001808*** (4.36)
$\Delta(\text{SHW})_{it-1}$	-0.001145† (1.22)	0.000502 (1.58)
$(\text{CEO Fractional ownership})_{it}^*$		0.910359*** (67.03)
$\Delta(\text{SHW})_{it}$		
Adjusted R ²	0.3341	0.8476
Pay-performance sensitivity β	0.016995***	0.020926***
F-statistics for β	335.852	2476.051

Note: t-values in parentheses, ***, **, * and † represent significant at 0.1%, 1%, 5% and 10% levels respectively.

In column (2) of Table 5 the positive and significant coefficient of the CEO fractional ownership implies that the sensitivity between CEO firm-specific wealth and firm market performance is affected by the CEO fractional ownership. The sum of pay-performance sensitivity is $\beta = 0.001808 + 0.910359 * (\text{fractional ownership})$. For a CEO with the median fractional ownership 2.11%, $\beta = 0.020926$ suggesting a change of \$ 20.93 in CEO pay for each \$1,000 change in shareholder wealth. This result is much larger than $\beta = 0.0020$ of Jensen & Murphy (1990b) and $\beta = 0.000291$ of Elo (2011). In addition to the weak of the stock market, the result suggests that CEO firm-specific wealth is more closely tied to the firm value for providing CEOs with more incentives over this economic period. Another reason arises from that the median value of CEO fractional ownership has a remarkable rise from 0.16% to 2.11% from the period 1970s-1980s to the period 2008-2012, thus the pay-performance incentives provided for CEOs are enhanced.

To sum up, if CEO inside stockholdings is considered into the firm-specific wealth, the CEO fractional ownership plays an important role in the pay-performance sensitivity. When the CEO fractional ownership is controlled, the sensitivity between CEO firm-specific wealth and firm accounting performance is negative and significant, which indicates that the improvement of accounting performance cannot have enough positive effect on the stock market performance or impose positive effects on the values of CEO inside stockholdings and CEO firm-specific wealth in the weak economy period. In the meanwhile, positive and significant pay-performance sensitivity is found between CEO firm-specific wealth and stock market performance. This result is even larger than findings of Elo (2011) and Jensen and Murphy (1990b). It suggests that CEO firm-specific wealth is more closely tied to firm value in order to provide more incentives for CEOs over this economic period, and another reason for the enhance pay-performance relationship can be the considerable raise of the CEO fractional ownership from the period 1970s-80s to the period 2008-2012.

7. CONCLUSION

Over the past five years from 2008 to 2012, a majority of important economic metrics in the US have been at weak levels due to the long-term impact of the financial crisis 2007-08, whereas CEO pay had gone in spite of the economic situation. Top executive pay-for-performance raises intense debates and becomes the front and center once again. In this background, there is a demand for studying on the true status of the pay-for-performance and supplying useful information on providing incentives for top executives especially CEOs to choose and to implement appropriate actions that will increase firm performance by aligning top executives' interests with shareholders' interests in this economy condition. Therefore, the empirical research part of this study using updated data and a pay-performance sensitivity approach investigates the pay-performance relationship over the past five years with weak economic metrics. The specification of the pay-for-performance in this kind of economic period is investigated by comparing with the results to corresponding previous findings. In a whole, this study devotes to supply useful information on providing CEOs with incentives through the pay-for-performance over a period with weak economic metrics.

The theoretical part of this study addresses the principal-agent problem and identifies four approaches to align executive interests with shareholder interests. The approaches basically involve monitoring, monetary incentives, non-monetary incentives, and equity ownerships. CEO compensation policy as a monetary incentive is assumed to solve the agency problems. From the view of corporate governance, different compensation component generates different degrees of risk-takings and different orientations in executive decision makings. Cash compensation including basic salaries and bonus plans is mostly used as an entitlement program rather than a motivation program for stimulating performance. Incentive compensation including stock options granted, restricted stock grants, long-term incentive payouts and other forms of pay, is more virtually drives the total pay-for-performance relationship and is acclaimed in firms with cash constrains. Besides, executives obtain substantial other types of payouts such perks, pensions and

separation pay which are largely decoupled from firm performance and further boost the pay-without-performance.

Firm performance measurements are classified into accounting performance measurements, stock market performance measurements and combination performance measurements. The rules for measuring accounting returns and accounting items in financial statements and are clearly defined, thus the variance of the accounting measurements is reduced. Also, external auditors provide periodic checks on the objectivities of firm accounting reports, thence accounting performance measurements are relatively objective and accurate. The major advantage of accounting performance measurements is to help shielding executives from the market-wide movements of firm value that beyond executive controls since accounting measurements are not that associated with market-wide movements in firm value. Correspondingly, the major limitation of accounting performance measurements is that they cannot reflect the changes of shareholder values. Therefore, updated accounting measures are advised to make up for this limitation. Market performance measures get executives paid as the same way as the shareholders get paid thereby align executive interests with shareholder interests. Combination performance measurements provide a more complete reflection of the performance that cannot be sufficiently reflected or weighted enough by a single performance measure.

As to theoretical researches on the pay-for-performance relationships, in previous studies, a small positive but significant coefficient is generally found while CEO equity-based compensation primarily drives all of the pay-performance sensitivity and elasticity. At the same time, a positive effect of CEO fractional ownership on the pay-performance relationship is found, whereas a non-monotonic relationship is suggested from the view of the costs of stock ownerships. A significant curvilinear relationship or a non-linear relationship is found between executive ownership and firm performance.

In the empirical research of this study, the sensitivities between CEO total compensation and firm performances are lower relative to the previous findings of Jensen & Murphy (1990b) and Elo (2011), which is mainly driven by the looser linkage of CEO cash compensation with firm performances. It indicates cash

compensation is less used to provide incentives for CEOs over this weak economy period. This result consists with the finding of Matolcsy (2000) which indicates a weak or zero relation between executive cash pay and firm accounting performance in an economic downturn. It also indicates that the function of base salaries as a fixed component of the pay contract for insuring livelihood, guaranteeing financial stability and diluting risks that beyond executive controls tends to be more remarkable over this economic period. Furthermore, the positive and significant sensitivity between CEO total compensation and firm market performance is larger relative to previous findings, which is mainly driven by the closer linkage of CEO incentive compensation with firm market performance. This result suggests that in a weak economy, incentive compensation is more frequently used to provide CEOs with incentives to improve firm value. In addition, when the effect of lagged performance is considered into the test for incentive compensation, the coefficients are small but more significant in comparison with which of previous studies, implying that CEO incentive compensation is more significantly associated with prior performances in a weak economy. Moreover, this study indicates that CEO incentive compensation is more closely tied to firm performance than CEO cash compensation is.

At the same time, when CEO inside stockholdings is considered into term of CEO firm-specific wealth, the CEO fractional ownership plays an important role on the pay-performance sensitivity. When the CEO fractional ownership is controlled, the sensitivity between CEO firm-specific wealth and firm accounting performance is negative and significant. It indicates that the raise of firm accounting performance cannot have enough positive effects on the stock performance or impose enough positive effects on the value of CEO inside stockholdings and CEO firm-specific wealth. The positive and significant pay-performance sensitivity is found between CEO firm-specific wealth and firm market performance, and it is even larger than previous findings. The result suggests that CEO firm-specific wealth is closer tied to firm value in order to provide CEOs with more incentives over the period with weak economic metrics. Also, the considerable raise of CEO fractional ownership from the period 1970s-1980s to the period 2008-2012 is considered to enhance the pay-performance incentive.

Several limitations are embedded in this study. In order to compare with previous findings like which of Jensen and Murphy (1990b), CEO-specific factors, firm-specific factors as well as the year, industry and market dummies are not controlled, which might affect the reliability of the study results. The research period of this study is indistinctly defined as a period with weak economic metrics since findings on when and whether the recession of the US has ended are contentious. In addition, the sample size is not large enough since the study investigates both contemporaneous and lagged performances while consecutive financial and compensation figures are required for each raw observation. A wider data sample would provide more reliable results since external effects would be more extensively mitigated.

Future studies could be developed into following directions. For interpreting the causal relations of the pay-for-performance, the CEO-specific factors (e.g. CEO age, tenure and turn over), firm-specific factors (e.g. firm size, leverage and growth opportunity) as well as the year, industry and market dummies could be controlled in the examinations for interpreting the causality of the pay-performance relationship and improving the reliability of the examinations. The pay-performance elasticity and semi-elasticity approaches that are more non-variant with firm size relative to sensitivity approach could be applied in future examinations.

As suggested by Matolcsy (2000) various firm accounting performance measurements such as percentage changes in reported after-tax profit, yearly differences in trading profit over operating assets, yearly differences in earnings before interest and taxes over total assets, and yearly differences in net profit over shareholder funds, could be adopted in future pay-performance sensitivity tests. A future research avenue could be to consider the CEO personal wealth to investigate the pay-performance incentives by applying the pay-performance semi-elasticity or elasticity approach. Also, CEO pay could be measured in diverse combinations of different pay components. Another research direction could be to test the pay-performance relationship for firms within different industries. And the pay-performance examinations for different economic periods with explicit definitions, such as an economic upturn, an economic flat recovery and an economic downturn could be considered. Finally, the performance target setting that plays an increasingly

important role in providing incentives for CEOs could be investigated in future studies.

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