CEO REMUNERATION, BOARD COMPOSITION AND FIRM PERFORMANCE: EMPIRICAL EVIDENCE FROM AUSTRALIAN LISTED COMPANIES

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Abstract

Classical economic theories establishing a relationship between CEO remuneration and firm performance has paid particular attention to solve conflict of interest between managerial team and firm shareholders, by designing an optimum CEO remuneration that motivate executives to work in the best interest of shareholders. Many international and less Australian empirical researches suggest that there is overwhelming evidence that firm performance is strongly linked with CEO remuneration. In this paper, we reassess the association of firm performance and CEO remuneration variables using dynamic econometric models and comprehensive data from Australian Stock Exchange (ASX). We find a positive and strong association between CEO pay of top 200 Australian public listed companies and company performance. Obtained findings are similar to USA, UK and Canada studies results. We further test the effect of board and ownership features on CEO remuneration–performance sensitivity in the top 200 Australian public companies listed on ASX. Specifically, for the period of 2003-2007, our results highlight the importance of ownership structure in influencing remuneration–performance relationship. Monitoring block holders boost the responsiveness of long term incentives (LTI) remuneration to performance, thus straightening shareholder and manager welfares. However, based on a short term investment horizon strategy, insider block holders increase (decrease) the sensitivity of short-term incentives remuneration (long term incentives pay). Surprisingly, for the period 2008-2013, our findings suggest that ownership and board features did not influence significantly CEO pay-performance sensitivities. Finally, we find that larger boards increase (decrease) the responsiveness of CEO's known remuneration (long term incentives) to performance.

Keyword: CEO, Remuneration, Board of Directors, Australia

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1 Introduction

Corporate governance issues continue to be the main dominating themes in financial media for the last decade. The collapse of major Australian companies such as HIH insurance and Ansett Airlines and other big international corporate like Enron and recently Lehman Brothers has made brought back research interests and attention. The corporate failure concern has resulted in many initiatives by regulatory agencies, in particular Australian Prudential regulation Authority (APRA), Australian Securities and Investments Commission (ASIC), Reserve Bank of Australia (RBA), Australian Stock Exchange (ASX) and other regulatory private agencies to tighten regulative mechanisms and implement vigorous measures to prevent similar corporate scandals. These regulative agencies have also provided standards guidelines to the board of directors that will be useful in preventing future corporate misconducts (Merhebi et al., 2006). In spite of encouraging corporate governance statements that are in line with Government regulatory requirements and Australian Stock Exchange guidelines, CEO remuneration has been a persistent source of public debate in media.

Preciously, the association of CEO remuneration and firm performance has been a major issue in public debate. According to The CEO Institute survey (2012) the Australian Council of Superannuation Investors (2013), which examined the remuneration of CEOs of ASX 100 index, observe that CEO pay and bonuses have risen over 200% over the past 10 years, although return to shareholders increased by only 31%. The council also noted that CEOs took home about 70 times the national average salary in 2013 compared to 94 times the national average in 2007 before Global Financial Crisis (GFC) (Wilkins, 2013). Given this, one would ask if what we have seen in corporate governance statements is in line with the reality of things. It is therefore critical that Board members should be able to explain reasons for such drastic increase and be able to defend if CEOs are paid for their performance. The board should also clarify wither there are any significant associations between CEO remuneration and firm performance which will benefit shareholder and other stakeholders in the long-run. These differences are not only observable at the national level, but also across the national borders. In the following sections we observe that the US and Australian corporate backgrounds differ at both

corporate governance and CEO remuneration mechanisms and later we analyse the impact of Australian regulatory framework on executive remuneration, firm performance and corporate governance.

The Australian versus American Corporations

The US and Australian corporate backgrounds both differ in the sense market structure and firm level characteristics. Industry differences are observed through corporate characteristics that are unique each market. Specifically, a greater concentration of mineral resource-based public companies is observable in Australian market as opposed to the US. For instance, these firms constitute about 26% of our sample for the period 2003-2013. Firm-level differences are observed in both economies. For instance, Schultz et al. (2013) note that board of directors are normally smaller and have a lower fraction of non-executive directors in the case of Australia. Thus, many small resources companies listed on ASX are interested in hiring directors based on their skills and experience rather than their independence (Schultz et al., 2013 and ASX, 2009). Another difference observed is the fact that boards of directors in Australian firms are made of a larger proportion of non-independent directors and frequently CEOs hold the chairmanship of the board in many organizations. However, in the case of US the proportion of independent directors that sit on company boards are significantly higher and the percentage of CEOs who act as chairman are much lower (Schultz et al., 2013 and Fernandes et al., 2012). Dissimilarities are further noticeable in the ways CEOs are remunerated. While the payment of United States CEOs is heavily based on shares and options payment, salary and other fixed component of remuneration paid to Australian CEOs constitute a greater part of their overall remuneration (Hill et al., 2011; Schultz et al., 2013 and Fernandes et al., 2012). For instance, 46% of CEOs' pay in Australia is rewarded in form of fixed salary and only 18% of all remuneration is rewarded as stocks and options (Fernandes et al., 2012 and Schultz et al., 2013). On Contrary, Fernandes et al. (2012) and Schultz et al. (2013) both highlight that salary and equity components are respectively 25% and 39% of total payment in the USA. In addition, Murphy (2013) and Schultz et al. (2013) argue that US companies' remuneration model is based on tax policies that put in place a one million dollar cap on tax deductible payment remuneration and US stock exchange listing rules that encourage equity and options components of remuneration. However, comparable inducements in form of regulated payments are not observed in the Australian market (Schultz et al., 2013) and normally,

these incentives promote shareholders' wealth by aligning managers and stockholders' interests.

In terms of regulatory settings, Australian public companies are supervised by ASIC, a body that is established under the Corporations Act 2001 to oversee the conduct of financial institutions in the country. In this regard, ASIC is charged with responsibility for overseeing the smooth operations of the financial markets and to ensure that Australian listed companies comply with all the regulative requirement. Schedule 5 of the Act obliges Australian firms to disclosure top executives remuneration. Schultz et al. (2013) and Merhebi et al. (2006) emphasize that before October 1986, listed businesses entities were obliged to reveal brief information about total compensation of top executive officers who were earning more than $A100,000. However, comprehensive disclosures concerning executive remuneration were not mandatory until July 1998, when the government decided to introduce the Company Law Review Act 1998 (Schultz et al., 2013). Canyon and Murphy (2000) and Merhebi et al (2006) argue that s300A of the Corporation Act requires companies to disclosure all type of compensation components remunerated to all board members and top executives officers in the annual financial statements from 1st July 1998. Since then these requirements were similar to the practices legislation provisions of other OECD countries such as Canada, UK and USA. These disclosures have to identify separately "salaries, fees, benefits including motor vehicles and accommodation, fringe benefits tax, bonuses, superannuation contributions, termination payments, both short-term and long-term incentive payments, and the value of shares and options issued to directors" (Merhebi et al., 2006).

Similarly, several modifications designed to promote disclosures of executives and board member compensation in financial statements for reporting entities were introduced after 1998. Schultz et al. (2013) confirm that in 2003, the Australian Securities Exchange (ASX) has published 'Principles of Good Governance and Best Practice'. This document sets out and details principles and recommendations which should guide each reporting entity to achieve good corporate governance objectives and meet investors' expectations. In more precise terms, it establishes how to reward executives properly based on financial performance of firms. This regulative requirement came into effect on 31st December 2003. Although there were various amendments made to the original version in the following years, publically listed companies are not directly coerced to obey it but are expected to disclosure any noncompliance (Schultz et al., 2013).

In the beginning of 2004, the Australian Accounting Standards Board (AASB) released AASB 1046 entitled 'Director and Executive Disclosures by Disclosing Entities' which emphasises on the need for additional requirements concerning the valuation and

disclosure of top executives and directors remuneration (Schultz et al., 2013). Moreover, it requires transparency in determination of executives' remuneration components. While recent regulatory changes have an impact on the determination and disclosing of board members and top executives remuneration, it was the issuance of AASB 1046 in 2004 that brought about the most significant improvements in the quality and extent of remuneration disclosure (Clarkson et al., 2006). The Corporate Law Economic Reform Program (CLERP9) amendments requiring an audited remuneration report and an advisory shareholder vote on the compensation structure at the AGM also served to focus greater board and public attention on executive pay practices. Finally, throughout this period were various changes were implemented, executive remuneration has been subject to increasing levels of public scrutiny and debate, but even more so after the global finance crisis (GFC). Due to the above reasons, this timely study aims to examine the effect of governance mechanisms on Pay-Performance relationship under two sub periods: before GFC and after GFC. We use detailed company data from 2003 to 2013 and dynamic empirical model to undertake our analysis.

The relationship between governance variables and CEO pay on one side and CEO pay–performance association on the other side have been extensively documented in the literature. However, Merhebi et al. (2006) and Schultz et al. (2013) both elaborate that there are insufficient researches undertaken on CEO pay-performance in Australia compared to other countries. Furthermore, the existing literature is less focused on the influence of governance mechanisms on CEO remuneration and firm performance relationship. The main objective of our paper is to revisit the relation between CEO pay, shareholders value and governance mechanisms [namely ownership and board structures] and investigate whether this remains consistent during expansionary period (2003-2007 inclusive) and recessionary period of GFC (2008-2013 inclusive). By empirically re-examining the relation between CEO remuneration, shareholders value and governance mechanisms, this study will add value to the existing literature related to CEO pay-performance and corporate governance. Our study here builds on Jensen and Meckling (1970) seminal research in two folds: Firstly, by analysing data from two subsamples, our results are expected to provide insight into the nature of CEO remuneration and firm performance linkages during high growth and recessionary phases of an economy. With the exception Gregg, Machin and Szymanski (1993) in UK, to our best knowledge previous Australian researches did not examine the dynamics between CEO remuneration and corporate performance in both economic expansionary and recessionary periods. Secondly, this research aims to examine the empirical issue of board composition and ownership structure and their effect on the CEO pay-firm value

association. Finally, by examining how firm performance, ownership structure and board formation impact CEO pay-performance sensitivities, the study will provide important policy implications. In Australia, CEO compensation mechanism seems to receive comparatively less attention and top compensation culture is a much less researched area. Prior Australian studies find either negative (Fosberg, 1999) or no correlation between CEO remuneration and firm value (O'Reilly et al., 1988). However, Merhebi et al., (2006) and Schultz et al., (2013) report a positive correlation between CEO remuneration and financial performance of Australian companies which is consistent with international findings. Our research therefore intends to answer the following key empirical questions: *Are CEO remunerations statistically and significantly associated with firm value/shareholder value/firm performance? Do corporate governance structures have any significant impact on CEO remuneration and firm value association?*

2 Brief Literature Review

A growing list of empirical literature has attempted to investigate whether CEOs remunerations are associated with firm size and their performance and if corporate governance mechanisms have any significant influence on CEO remuneration. Undoubtedly, the most documented association in the Executive remuneration literature is the rapport between CEO compensation and firm size. CEOs of big companies are paid more. This is normally justified by the complexity of jobs performed by executive officers of large firm (Murphy, 1999). Specifically, findings from much earlier studies (see Smith and Watts, 1992 and Rosen, 1982) suggest that CEOs of big companies need talented and competent managers with capacity and experience to decide on very complex operations and tasks. These managers also assume responsibilities for the outcomes of these greater decisions on the performance of those institutions. It is therefore natural that they expect to be remunerated according to the nature of the work performed. Cahan et al. (2005) elaborate that the complexity of managers' job and the firm size have been recently increasing faster, and as a result, driving the current increases in CEO remuneration. In addition to the complexity of managers' task and the firm size, Murphy (1999) points out that industry influences the level of CEO pay. Using comprehensive data collected from US public companies, the study observes that variation in executive remuneration changes with industry as follow: From 1992 to 1996 the median of CEOs pay has increased considerably for manufacturing sector (an increase of 55% from $2.0 million in 1992 to just about $3.2 million in 1996) and in finance sector the data shows an increase of about 53% while in utilities sector the CEO remuneration has seen much less

increment compared to other sectors - an increase of only about 34% in the same period (Murphy, 1999). Similarly, the level of executive remuneration is argued to vary considerably depending on the levels of executives in a firm. Some researchers (Core and Larker, 2001) highlight that that CEO remuneration packages are unique and are designed to align CEOs and shareholders' interests. However, there exist some empirical evidence (Finkelstein and Hambrick, 1996) and theories (Henderson and Fredrickson, 2001) to suggest that senior executive pay arrangements are hardly same. Differences in CEO pay reside in the fact that responsibilities of a Chief executive officer and other top managerial team may overlap, while their expertise and roles within the company differ. Specifically, remuneration structures of top executives vary with the managerial hierarchy. For executive officers other than CEO, equity and option based remuneration start to become less and less part of total remuneration as you move from CEO (Core and Larcker, 2001). Usually, base salary constitutes a significant amount of non-CEO executive officers' remuneration as compared to CEO fixed salary structure (Core and Larcker, 2001). Moreover, change in shares market prices may not normally incorporate the effect of any significant decisions taken by non-CEO executives, and generally, the remunerating of non-CEO executive officers are based on performance metrics of departments or division within an organisation (Bushman, Indjejikian and Smith, 1995). Therefore firms differ considerably in their use of equity and option while remunerating their non-CEO executive officers.

Studies have used theoretical frameworks such as agency theories and incentive models to link executive remuneration and firm performance. It is believed that social norms play an important role in this process. Numerous Executives remuneration experts (see Lambert and Larcker, 1987; Banker and Datar, 1989) advocate the importance of accounting measures in determining the firm performance, suggesting that the indicators should be used in determining CEOs and other top executive officers remuneration contracts. There is a key assumption behind this consideration as argued by Lambert and Larcker (1987) and Banker and Datar (1989). These authors argue that stock prices are very noisy, and therefore, while they indicate the performance of the firm as a whole, they may hide CEO's inability to perform efficiently and thus lead to overpayment of less performing CEOs. Many studies have put a considerable effort to establish the empirical association between top executives remuneration and firm performance. Concern about corporate governance has been the dominating theme in Western financial media for the last decade, if not more. The mega corporate failures in many developed countries and ensuing events have led to many initiatives by regulatory agencies to initiate timely reforms. Many existing empirical studies on corporate governance examine the effect of board and ownership features on CEOs remuneration while others focus on the mechanisms of board control in influencing CEOs compensation. Starting with the influence of governance structures on CEO's remuneration, the empirical evidence appears to be mixed. Main, O'Reilly, and Wade (1995) examined the effect of CEOs who also manage their remuneration committee and CEO remunerations. This study reports overwhelming evidence showing that a stronger relationship between compensation committee and CEOs often leads to a higher CEO pay. Similarly, using a sample of 105 firms, O'Reilly, Main and Crystal (1988) have analysed members of remuneration committee who are employed as executives in other companies and find that CEO remuneration is positively and significantly associated with executive pay at the committee members' company. While utilizing a sample of 161 companies in 1993, Newman and Mozes (1997) find that the CEO remuneration-firm performance link is weak and the level of CEO remuneration is considerably high, when CEOs are also members of remuneration committee. However, examining 50 CEOs who sit on their own compensation committees for the period of 1985-1994, Anderson (1997) observes that these CEOs on average receive lower levels of salary and a high level of equity and options. This package allows these CEOs to act like investors rather than agents of companies' owners. Overall, the reported statistical evidence imply that the role played by a CEO in a firm and how he/she interacts with board members has a major impact on governance mechanisms and consequently the level and structure of their pay.

Looking at the characteristics of the board, many empirical studies argue that a weak board of directors usually leads to an excessive remuneration of CEOs. Study by Core, Holthausen and Larcker (1999) suggest that when the board is relatively large (small), CEO compensation is found to be higher (lower). The authors observe that having a large board may lead structural difficulties that may hamper effective opposition to the CEO and therefore make little efforts to deter unnecessary increment in CEO remuneration. The existence of a large board may therefore lead to an overpayment of the CEO. In addition, Cyert, Kang and Kumar (20020 and Core, Holthausen and Larcker (1999) argue that once a CEO also assumes Chairman duties (duality) in the same company, CEO remuneration is found to be higher. Hall and Murphy (2002) provide evidence suggesting that when CEOs participate in determining each other's remuneration by serving on each other's remuneration committees the level of CEO remuneration increases over time.

Many studies have focussed on the association between CEO pay and outside directors, with some reporting a positive link. Boyd (1994) and Lambert et al. (1993) observe a positive association between CEO pay and independent directors. An analysis by

Hallock (1997) shows that CEO pay tends to be higher when directors in a company are interlocked with outside directors leading to an overpaid CEO remuneration system. Similarly, Andjelkovic, Boyle and McNoe (2002) report empirical evidence pointing out that CEO remuneration is strongly associated with the incidence of CEO holding multiple directorships, the percentage of insiders' directors and the existence of directors on the board who represent the interest of outside block holders. Surprisingly, the results of this study reveal no statistical correlation between the size of the board and CEO remuneration. However, other studies that have found no association between CEO remuneration, outsiders and insiders' directors include Finkelstein and Hambrick (1988).

In one of the most comprehensive research related to the association between CEO remuneration and governance related characteristics, Cyert, Kang and Kumar (1997) examined the CEO remuneration of 1,671 companies traded in USA markets. Their results show that the structure of the board plays a major role in determining CEO pay, observing that CEO remuneration decreases with ownership of the largest stockholder, increase in risk of bankruptcy and the existence of board of director's ownership. On the other hand, the results suggest that CEO remuneration mainly increases with the ratio of independent directors on the board, CEO ownership and the tenure of the CEO of the company. But, their findings provide no statistical evidence to suggest the existence of many directors on the board leads to an increase in CEO remuneration, but the later increases when the CEO acts as the chairman of the board in the same firm. These empirical results remain unchanged after controlling for other determining factor of CEO remuneration, such as company size, accounting methods and market based performance metrics. Other empirical studies that establish a negative link between CEO pay and the ownership of directors who sit on compensation committee includes Cyert, Kang and Kumar (2002) which details that expanding CEO ownership decreases CEO's equity and option remuneration by 4 to 5 percent.

The bulk of previous research argued that inside directors were essentially pawns of CEO (Boyd, 1994). While using data collected from 193 manufacturing, transportation, minerals and financial services listed companies in the USA, Boyd (1994) observes that the ratio of insiders and CEOs remunerations are negatively linked. In a different study, Lambert et al. (1993) document a positive correlation among key variables such as CEO compensation and the ratio of non-executive directors on the board. However, other empirical studies that found no positive association between CEO pay and the proportion of independent directors include Finkelstein and Hambrick (1989) and Randoy and Nielsen (2002). Finkelstein and Hambrick (1989) utilized a panel data on CEO remuneration for the periods 1971, 1976, 1982 and 1983 report that CEO pay was not significantly associated with the ratio of non-executive directors on the board. Randoy and Nielsen (2002) investigate the empirical association among CEO pay, governance features and firm performance variables based on data from Norwegian and Sweden companies (120 and 104 respectively) listed on their respective stock exchange markets in 1998. Their empirical analysis suggests that CEOs remuneration and total number of directors on the board on one hand and CEOs remuneration and insiders' ownership on the other hand are positively associated. Results from this cross-sectional data also establish an empirical association between company outstanding shares market value and CEO pay, although they report no statistical link between CEO remuneration and firm performance.

Focusing on firm ownership (which is important to stockholders since their prime interest is to maximize the firm value) the key concern is how the company is managed to reach its prime goal (of maximizing shareholders value). Only a handful of empirical researches investigate the relationship between the ownership pattern and CEO remuneration (see Cyert, Kang and Kumar, 2002 and Core et al., 1999), even though various theories have been put forward to argue the importance of ownership structure in playing the critical role of monitoring managerial actions and determining remuneration structure (Core et al., 1999). In fact, empirical studies such as Cyert, Kang and Kumar (2002) find a negative relationship between top executives remuneration and ownership of the largest stock holders observing that "doubling the percentage ownership of the outside shareholder reduces non-salary compensation by 12–14 percent". In a much earlier study, Shleifer and Vishny (1986) show that the existence of a large stockholder allows principle shareholders of the company to closely monitor managerial decisions and thereby reducing the power of top managers in setting their remuneration but match CEOs pay to the actual firm performance indicators. In support of this, Benz, Kucher and Stutzer (2001), while using data from top 500 companies listed in US exchanges markets between 1992-1997, observe that that a higher concentration of equity holders leads to a reduction in the level of options and equity paid to top executives.

3 Data, Methodology and Result Analysis

In this section, we empirically assess the effect of changes in firm size, firm performance and corporate governance indicators have on CEO remuneration. Based on the literature, the link between company size and CEO remuneration can be estimated by:

$$\ln(\text{CEO Pay})_{i,t} = \alpha + \beta \ln(\text{Firm Size})_{i,t} + \varepsilon_{i,t} \qquad (1)$$

where $\ln(\text{CEO Pay})_{i,t}$ is the natural logarithm of the level of CEO pay for firm i in period t proxied by CEO Fixed payment (Known), short term incentives

(STI), long term incentives (LTI) and the sum of all these three components (Total). Ln(Firm Size)$_{i,t}$ is the natural logarithm of company size expressed in terms of total revenue and assets and ε is a random term or error variable – accounting for all other aspects (measurable or immeasurable) not explained by the model. Eight regression equations are derived from model (1). Following Merhebi et al., (2006) we estimate pay-performance as:

ln(CEO Pay)$_{i,t}$ = α + βln(Firm Size)$_{i,t}$ + Ω Performance i,t + ε$_{i,t}$,   (2)

where ln(CEO Pay)$_{i,t}$ and ln(Firm Size)$_{i,t}$ have been defined previously and performance$_{i,t}$ is is proxied by two accounting indicators namely return on asset (ROA) and return on equity (ROE) and two other market based performance indicators namely total shareholders return *(TSR)* and Tobin's Q *(TQ)*. Although current executive remuneration literature uses numerous models to examine the CEO compensation and shareholders value association, we follow Jensen and Murphy's (1990) and estimate the model given as:

Δ ln (CEO Pay)$_{i,t}$ = α + βΔ ln (Shareholder Value)$_{i,t}$

+ ε$_{i,t}$ (3)

where *Δ CEO Pay $_{i,t}$* is the change in CEO pay) between prior period (t-1 or the first lag) and the current reporting period (t) for firm i and *Δ(Shareholder Value)* is the variation in investor value (proxied by Market capitalisation) between prior period (t-1 or the first lag) and the current reporting period (t) for firm i. To assess the impact of governance mechanisms on CEO compensation–firm performance sensitivity, we estimate the following model which also includes an interaction term as discussed below:

Δ CEO Pay $_{i,t}$ = α + β Δ Shareholder Value $_{i,t}$ + μ Governance$_{i,t}$+δ[X*Governance]$_{i,t}$+ε$_{i,t}$ (4)

where Shareholders Value$_{i,t}$ is not only proxied by market capitalisation, but also by ROA, ROE, TSR and TQ. Governance$_{i,t}$ is a variable including measures of ownership and board features of a given firm as detailed above; and *[X*Governance]$_{i,t}$* is a vector of interactions between Shareholder Value $_{i,t}$ or performance $_{i,t}$ variables (represented by X) and a set of indicator variables that will take value one if a numerical value of a specific governance measure is greater than industry average and the nominated numerical value will be zero otherwise.

This research utilises annual data from 2003 to 2013, inclusive. Our population is made up of largest two hundred firm listed on Australian Stock Exchange (ASX 200). The sample is made from top 200 Australian public companies ranked by their market capitalisation in ABC newspaper for the years 2005 through 2010 and ranked also by the Connect 4

database based on their market capitalisation. Companies that are listed in both sources are included in our sample. Since we have data comprising both time series (from 2003 up to 2013 inclusive) and across largest two hundred Australian firms (ASX 200), we use panel techniques to estimate our models.

We divide our sample to create two sub-samples. The first sub-sample is matching the period of economic growth (2003-2007 inclusive) and the second one representing the recessionary period (2008-2013 inclusive). Initially, we gather variables related to CEO remuneration, board and ownership structure from Sirca database. Thereafter, we obtained all firm performance related variables from Data Analysis Premium and Connect 4 databases. For consistency, some extreme data points collected from these three databases (Circa, Data Analysis Premium and Connect 4 databases) were also compared against similar data points obtained from individual audited financial statements available online. To be a part of our sample, public companies had to have enough data required to estimate our econometric model. Some significantly missing observations were excluded from our sample depending on the time a firm has listed or delisted with Australian Stock Exchange (ASX). That means we ended up with the final balanced panel consisting of 171 Australian public companies that are part of ASX 200. However, the sample is large enough to represent the top 200 public companies and can be used for verifying our hypotheses.[1]

Return on equity is expressed as follow:

$$ROE = \frac{[net\ income - minority\ interest - preferred\ dividends]}{\frac{owners'equity\ (t) + owners'sequity(t-1)}{2}}$$

ROA is a measure of the rate of return of company assets earned after tax regardless the firm capital structure. ROA is an accepted comparable measure frequently used by researchers to compare financial performance of different companies across time (years), across industries or with other firms.

ROA is commonly computed as follows:

$$ROA = \frac{[net\ income - minority\ interest - preferred\ dividends]}{\frac{total\ asset\ (t) + total\ assets\ (t-1)}{2}}$$

Total shareholder return (TSR) is the market measure used to compute the actual returns on stock over time. The firm's adjusted Tobin's Q (TQ) is a market-to-book measure initially developed by James Tobin to estimate the average return on the companies' investment. The TQ ratio is computed as the share market value plus liabilities as specified in accounting books, all scaled by total assets:

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[1] Note that the industry/firm breakdown of our sample is provided in Table 1A. As can be seen for the details provided in the table, our data is well represented and covers a broad range industry background.

$$TQ = \frac{Market\ capitalisation + total\ liabilities}{total\ assets}$$

where assets have been defined in previous paragraphs; "liabilities are obligations of a company arising from past transactions or events which are expected to reduce economic benefits of the firm when they are settled" (see IASB's conceptual framework for financial reporting). Market Capitalization (MktCap) is a measure of firm value based on its stock price and outstanding shares being sold in equity market. It is usually a key element considered by many investors to determine the current market value of a firm. Based on Schultz empirical studies, corporate governance is represented by two different variables. *Board structure* measures which include *Board Size* (directors on a firm's board), *NED* (Non-Executive Director: the fraction of a company's board accounted for by independent directors), *Duality* (a variable equivalent to one if the same company the CEO also serves as the Chairman and otherwise the variable is equivalent to zero), *RemCom* (a variable equivalent to one if in a company there exists a compensation committee and otherwise the variable is equivalent to zero), *CEORemCom* (a variable equivalent to one if the CEO is a part of members on the compensation committee of the company, and otherwise the variable is equivalent to zero). According to Schultz et al. (2013), *ownership structure* measures which include *Monitor Block* (fraction of a company's total equity controlled by institutional investors who individually possess at least 5% of the firm's outstanding equity) and *Insider Block* (fraction of a firm's total equity controlled by firm's managerial team who each own at least 5% of the firm's market equity). We derive other firm-level descriptors including (i) firm earning ability or ratio of earnings before interest and taxes to net revenue earned *(EBIT Margin)* and (ii) leverage ratio.[2]

Major Result analysis

Table 1A presents an industry analysis of companies that constitute our subsamples. While the analysis reveals that a quarter of our sample is made of mining companies, this doesn't mislead the interpretation of our results because the actual weights of industries in our subsample are reliable considering what we observe in the index ASX 200. In general we observe that the key variables of the assembled data are skewed. According to Merhebi et al. (2006) the skewness of data variables is also found in distribution of data from USA, UK and Canada. Therefore logarithmic models are more appropriate to address skewness in data, to reduce the effect of extreme values and to minimize any heteroscedasticity problem that might end

contaminating our regressed models. To examine possibility of multicollinearity problems in our independent variables, we establish correlation matrix and examine association amongst variables. Having investigating this, we avoid using highly correlated independent variables in the same model. We also used this correlation matrix to verify the existence or non-existence of linear relationship among independent variables or between explanatory variables and dependent indicator. CEO remuneration and firm size do reveal a moderate association. But there is insufficient evidence to infer that there is existence of multicollinearity between independent variables: the later do not exhibit any strong correlation amongst them therefore we have no reason to exclude any variable in our models as stated in different hypothesis.

To investigate the associations that might exists amongst CEO compensation and firm size (proxied by total assets and revenue of firms) in Australia, we undertake here a number of estimations. Table 2 (from model 1 up to model 4) reports estimation results between firm's total assets and CEO remuneration for the period 2003-2007 and 2008-2013. The last four models (from model 5 to 8) consider the importance of firms' total revenue in determining the CEOs compensation in both periods under this study. Our results reveal that all elements of remuneration are positively and strongly associated, at the 1% level of significance, to the company size, measured using logarithm of total assets and revenue in both periods under this research. When the firm size is proxied by total assets, the size elasticity coefficients *(β)* for equation 1 vary across two sub-periods. For instance the size elasticity associated with firm's assets in 2003-2007 and 2008-2013 are respectively 0.1985[3] and 0.2299[4] and are significant at the 1% level. This suggests that an increase of 10% in total assets, total remuneration of a CEO is forecast to increase by 1.985% in the first period and 2.299% in the second period. Even though the magnitude of elasticity increased more than 15% in the second period, this size elasticity is still low in magnitude compared with those presented in Table 1B for UK (Cosh, 1975), Canada (Zhou, 2000), USA (Joskow and Rose, 1994), Japan (Kaplan, 1994), and previous Australian studies (Merhebi et al., 2006 and Schultz et al., 2013).

However, considering total revenue as a measure of a company size in Table 2, our model provides elasticities that are consistent with international studies as presented in Table 1B. On average, firm size elasticities are 0.24 and 0.27 respectively in 2003-2007 and 2008-2013 periods under this research. We can also observe an increase of 13% between two period's elasticities. This consistent increase in firm

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[2] This calculated as the sum of the book value of total liabilities divided by the sum of the market value of equity plus the book value of outstanding liabilities of the firm.

[3] We have reported the average of the size elasticities for the period 2003-2007 in Table 2.
[4] Details showing the average of the size elasticities for the period 2008-2013 are given in Table 2.

size elasticities might be an indication of an increase in CEO remuneration during the period of 2008-2013. However, these elasticities are still consistent with Merhebi et al. (2006) findings. This is expected since they use total revenue as a measure of company size. By examining size elasticities, generated by total revenue as a firm size proxy, corresponding to different components of CEO pay in both periods, we can conclude that our findings are consistent with international evidence that prove an existence of a strong and positive correlation amongst CEO remuneration and company size as assumed by our first hypothesis[5] .Our conclusion is also supported by the value of R-square that is great than 60% in all eight models and P-value of F-statistic that is significant at one per cent level in all estimated models (see Table 2). This implies that our model fit data variables well. Therefore it can be used to estimate and forecast CEOs remuneration for ASX 200 index.

We next seek to determine if there is a substantial and positive link among company performance and CEOs remuneration variables. We analyse the impact of firm performance measures (accounting and market based measures) on each component of the CEO remuneration (Known, STI, LTI and total) although most of previous studies were focussed on total remuneration or equity component of executive remuneration (Murphy, 1999; Merhebi et al., 2006). The results for the estimation are presented in Table 3. Our sixteen regressed equations related to pay-performance elasticity provide a unique and deep analysis of CEO pay- performance association for periods under this study. First, it is observable that all the four elements of CEO remuneration are positively associated with the size indicator of the company when we use the natural logarithm of total assets as the proxy for firm size (see Panel A and B). These results are similar to international and prior Australian empirical findings (see Kaplan, 1994; Zhou, 2000; Merhebi et al., 2006 and Schultz et al., 2013). Second, we observe that known component of CEO remuneration is unrelated to ROA, ROE, TSR and TQ in both periods. Third, we observe that short-term incentives (STI) are strongly and positively related to ROE and ROA in both period at the 1% level of significant as indicated in Models 5 and 6 (Panel A and B of Table 3), while short-term incentives are related to total shareholders return at the 10% level of significance in both periods (see Panel A and B, Model 7). Estimation under Model 8 reveals that Tobin' Q (TQ) is strongly and positively related to STI at the 1% level of significance in the second period while it is only significant at the 10% level in the first period. On the other hand, some estimation generates inconsistent results among periods of interest. We observe that LTI are positively related to

TSR and TQ (See Panel A, model 11 and model 12 of Table 3) in period 2003-2007, while they are positively related to ROA and ROE in the period 2008-2013 (See Panel B, model 9 and 10). We also observe that CEO total remuneration is positively associated with TQ for the period 2003-2007 (See Panel A, model 16) while it is positively linked to ROA and ROE in the period of 2008-2013 (See Panel B, model 13 and 14). The performance results of semi-elasticity are somehow consistent across the periods under this study, except few dissimilarities as specified in our regressed equations (See Panel A and B, from models 9 to 16). Most of our independent variables in equation (2) are strongly and positively related to certain components of CEO compensation. Few of them that are unrelated to CEO pay components are still part of our equations because the latter are associated with significant R^2 and F-statistic. This contrasts many previous Australian findings. For instance, Merhebi et al., (2006) findings estimate no association among CEO pay and firm performance measures such as ROE, ROA, TSR. Differences in our findings could be due to return data that is volatile for small companies, which form a substantial fraction of the sample in Merhebi et al. (2006) study. We also think that it might be due to the fact that CEO remuneration is aggregated and presented as one component in Merhebi et al. (2006)'s study. However, our results for the period 2003-2007 (see Table 4, Panel A) are consistent with Rosen (1992) findings who suggest that international comparison of stock return performance elasticities vary between 10% and 15%. Subsequent international studies estimated the performance elasticities to be slightly higher than Rosen (1992)'s. For instance, in Canada the elasticities is found to be 25% (see Zhou, 2000) and 22% in US (see Murphy, 1999). Therefore, our results support our prior expectations.

To test our next hypothesis[6], eight regression are estimated using specifications (3) and (4) (see Table 4). Table 4 reports estimation results that assess the possible statistical association between CEO remuneration and shareholder value or firm value. We present these results in separate Panels A and B while estimating two different versions of our model. Results show that STI, LTI and total remuneration are positively associated with firm value in both periods under this study. However, the size of estimated sensitivities is marginally different. For the period 2003-2007, the magnitude of sensitivities implies that an increase of AUD1000 of firm's market value (measured by market capitalisation of outstanding shares) results to an increase of AUD0.08 in both STI and LTI component of CEO remuneration and an increase of AUD0.16 in total compensation. Meanwhile, for the period 2008-2013, the magnitude of assessed sensitivities implies that if a firm's market

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[5] CEOs remuneration of top 200 largest Australian public companies is significantly and positively associated with firm size.

[6] Changes in CEO remuneration from one period to the next have a significantly positive association with changes in shareholder value over the current and previous period.

value increases by AUD1000, this leads to an increase of AUD0.09 in in STI, a A$0.17 increase in LTI and an increase of AUD0.19 in CEO total pay (see Panel A). Nevertheless, the expected elasticities of CEO remuneration as regards to a firm's market value are all conclusively positive, substantial and of identical size for the both periods. The magnitude of the elasticities implies that an increase of 1% in firm's market value results in an increase of 0.05% of CEO's salary remuneration, an increase of 0.80% in STI remuneration, an increase of 0.87% in LTI pay, and an increase of 0.19% in total remuneration for the period 2003-2007 (see Table 4, Panel B). For 2008-2013 period, an increase in 1% of a firm's market value leads to an increase of 0.76% in STI pay, an increase of 0.89% in LTI remuneration, and 0.21% rise in total remuneration for the period 2003-2007 (see Table 4, Panel B). As anticipated, our estimated CEO remuneration performance sensitivities (elasticity) seem to be weaker (stronger) than estimates stated in the work of Jensen and Murphy (1990) in relation to United States public companies. The magnitude of the assessed sensitivities and elasticities are similar to estimates established in Australian studies (see Table 5). Our findings suggest that both sensitivities and elasticities equations derived from model (3) support CEO remuneration and Shareholders value hypothesis. However, we consider the elasticity equation (3) the most suitable for this skewed data.

We next consider the role of governance measures in shaping pay levels as presented in equation (4). Table 6 presents regression results that estimate the impact of governance variables on CEO pay. Overall, we find overwhelming evidence of a statistical link among CEO remuneration and effectiveness of board monitoring activity variables. Particularly, we find that and the existence of a compensation committee and the percentages of independent directors in a firm both negatively influence some elements of CEO remuneration (Table 6). These results somehow differ from Schultz et al, (2013) findings however, they are in line with the expectation that greater monitoring would, on average, reduce CEO remuneration. Also, the positive effect of CEO duality on remuneration of CEO as presented in our findings was expected. However, with the above exceptions, our findings establish no impact of board structure on CEO remuneration. We test the fourth hypothesis[7] by including some elements of board structures (namely the ratio of independent directors sitting on the board, presence of remuneration committee and duality in CEO-Pay and performance dynamics).

Our analysis emphasis on the sensitivity of variables association where Panel A and B of Table 6

present the details of investigation. By assessing the significance of coefficients of interaction variables (among corporate governance and firm performance variables), we present evidence that highlight the influence of corporate governance variables on CEO pay–firm performance sensitivity.

For 2003-2007 the period, results emphasize on the divergent but significant roles played by both insider and monitoring block holders (see Table 6, Panel B). For instance, high concentrations of monitor block holders are significantly linked with improved CEO remuneration–firm performance sensitivities of LTI remuneration. This is exactly related to the pre-established theory which states that that monitor block holders focus on the performance of equity markets, effectively aligning equity holders and managers interests (see Schultz et al., 2013). Consistent with the work of Schultz et al. (2013), we estimate also that high concentration of insider block holders is statistically linked to an improved sensitivity of STI to firm performance. In Contrast, our findings suggest no association among CEO's LTI payment and firm performance variables. Combined, our findings emphasize on differences in the decision making process horizons among executives and external owners' equity. Managers are evidently interested in the performance for a short term period and, subsequently, replacing STI for LTI remuneration. The 2003-2007 period results similarly imply that large boards have contradictory impact on the responsiveness of some elements of CEO remuneration to firm performance. Evidently, while a larger board is coupled with the increased sensitivity of salary emolument to changes in firm value/shareholder value, they are also associated with a reduction in the sensitivity of LTI remuneration to the market based performance measures. Combined, these two results imply that CEOs working for firms with a large board are not necessarily motivated to act in the best interests of equity's owners. This finding supports a well-established theory in corporate governance that accuses large boards to be less effective (see Schultz et al., 2013).

We also observe that a high proportion of non-executives board members is positively associated with long term incentives pay of CEO. Our findings prove the importance of non-executives directors in increasing the shareholder value. Except above results, our findings possess no conclusive proof about the impact of board structures on CEO remuneration– firm performance link. Similarly, the findings in Panel A of Table 6 provide no strong evidence to conclude that corporate governance measures possess a substantial influence on CEO remuneration and firm performance sensitivities for the period 2008-2013. Although this is inconsistent with the results observed in US, these results are anticipated given the substitutability of external and internal corporate governance instruments (Tian and Twite, 2010 and Schultz et al., 2013) and remarkable

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[7] A smaller board, greater presence of non-executive directors, lack of Chairman/CEO duality and presence of remuneration committee where the CEO is not a member is negatively associated with CEO remuneration.

differences in institutions across Australian and US equity markets.

Conclusion and Some Policy Implications

Corporate governance, remuneration structure and firm value continues to a topic of a greater interest to many academic researchers and practitioners. This study conducts variety of empirical tests involving the association between CEOs remuneration and firm performance association initially, and further examination on the influence of governance structures on CEO remuneration and firm performance associations. Using a sample of top 200 Australian public companies, we examined the influence of company performance on a variety of CEO's pay components in the first stage of our analysis. The study then carries out empirical analysis to assess how the CEOs remuneration and firm performance sensitivities are influenced by the ownership and boards structures.

To test our first and second hypothesis (the associations between CEO pay, firm performance and firm size), we construct a panel data using a sample of 171 listed companies that constitute top 200 Australian public companies for the years 2003–2013 inclusive, and found that CEO compensation is significantly influenced by both company performance and size. These findings are generally similar to results established from USA, Canada, Japan and UK studies. In fact, CEO pay and company size are strongly and positively associated in various estimations. The company size elasticity coefficients vary across two periods under this study when total assets and total revenue are used as a proxy for company size. We observe that the size elasticity associated with firm's assets in the periods 2003-2007 and 2008-2013 are respectively 0.1985[8] and 0.2299[9] and are statistically significant at the one per cent level. This indicates that an increase of 10% in total assets leads to an increase of 1.985 % in total remuneration of a CEO in the first period and 2.299 per cent in the second period. Even though the magnitude of elasticity increases by more than 15% in the second period, the observed size elasticity is still low in magnitude compared to those obtained from similar international studies (Cosh, 1975; Zhou, 2000 and Joskow and Rose, 1994). However, when using total revenue as an indicator of company size as specified in Table 2, our estimation model provides elasticities that are consistent with international studies as presented in Table 3. On average, firm size elasticities are 0.24 and 0.27 respectively in 2003-2007 and 2008-2013 periods for this research. Overall, we observe an increase of 13% between two period's elasticities. This consistent increase in firm

size elasticities might be an indication of an increase in CEO remuneration during the period of 2008-2013. However, these elasticities are still consistent with previous studies such as Merhebi et al. (2006) which use firm revenue as an indicator of a company size. Our findings are in line with the international literature, indicating the existence of a strong and positive relationship among company size and CEO remuneration variables as expected in first hypothesis.

One of the main unique aspects of this research involves exploring the impact of firm performance in both economic growth and downturn periods (pre and post GFC) on each components of CEO remuneration (Known, STI, LTI and Total) as postulated in the second hypothesis. Based on the estimated elasticities, our results exhibit empirical evidence supporting a significant association among various CEO remuneration components and firm performance metrics such as ROA, ROE, TSR and TQ. Findings concerning CEO pay-performance semi-elasticities are somehow consistent across the periods under this research (2003-2007 and 2008-2013) except low dissimilarity as specified and outlined in our estimated results presented in Table 4. On contrary to findings reported in the previous Australian literature suggesting that CEO pay and financial performance (proxied by ROE and ROA) do not exhibit a significant association (see Merhebi et al., 2006), we provide empirical results indicating a positive relationship among CEO remuneration and firm performance. The magnitude of our coefficients are found to be similar to those reported in existing country specific studies of UK, USA and other developed countries where accounting based performance measures are used to examine the relationship. In particular, our findings support empirical observation from international studies such as Rosen (1992), Murphy (1999) and Zhou (2000).

While using various proxies to measure firm value and conducting additional sensitivity analyses, we our research reports a robust relation between shareholder value (firm value) and CEO pay as specified in our third hypothesis. Results show that STI, LTI and total remuneration are positively associated with firm value in both 2003-2007 and 2008-2013 periods, but the size of estimated coefficients are marginally different. For the period of 2003-2007, the magnitude of projected sensitivities suggests that an increase of AUD 1000 in firm's market value leads to an increase of AUD 0.08 in both STI and LTI component of CEO remuneration in addition to an increase of A$ 0.16 in total payment. Meanwhile, for the period of 2008-2013, the magnitude of assessed sensitivity suggests that an increase of AUD 1000 in firm's market value leads to an increase of AUD 0.09 in STI, a AUD 0.17 increase in LTI and an increase of AUD 0.19 in CEO total compensation. In regards to elasticities models, results exhibit similar magnitude of elasticities for both periods. The magnitude of the predicted elasticities

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[8] As mentioned earlier, the average of the size elasticities for the period 2003-2007 are reported in Table 2.
[9] Please note that the average of the size elasticities for the period 2008-2013 are elaborated Table 2.

suggests that an increase of 1% in firm's market value leads to an increase of about 0.06% in CEO salary remuneration, an increase of 0.80% in STI remuneration, a 0.87% increase in LTI pay, and 0.19% rise in total remuneration for the period 2003-2007 (see Table 5, Panel B). For 2008-2013 period, an increase in 1% of firm's market value gives an increase of 0.76% to CEO STI remuneration, an increase of 0.89% to CEO LTI remuneration and 0.21% rise in total remuneration (see Table 5, Panel B). As expected, coefficients of CEO remuneration-firm performance sensitivity (elasticity) seem to be weak (strong) compared to estimates reported by earlier works such as Jensen and Murphy (1990) which utilize data from United State public companies. However, the sizes of the estimates are consistent with the Australian findings published in previous studies (see Schultz et al., 2013 and Merhebi et al., 2006).

Considering the role played governance measures in shaping pay levels as postulated in our forth hypothesis, our findings suggest that existence of a large percentage of independent directors sitting on the board and a compensation committee in a firm both negatively influence some elements of CEO remuneration in both periods under this study. As expected, these findings match the theoretical framework and observation from previous empirical researches (see Schultz et al., 2013). As expected, our results suggest that if Chief Executive also acts as chairman of a firm (i.e. assumes the duality role), CEO remuneration – firm performance association is distorted by the overpayment of a CEO in this type of directors' remuneration regime. Our findings here are contrary the results reported by Schultz et al. (2013). Policy-wise, we observe that institutional investors in ASX 200 may play a major role in determination CEO pay – firm value only during an economic growth period. This means that during economic expansionary period, institutional investors intervene to reorganise ineffective board of directors and produce and promote good corporate governance guidance and policies (such as CEO compensation structure, corporate reforms guidelines and efficiency enhancing measures). Based on our reported statistical evidence, we have no reason to infer that institutional investors have any significant influence on firm performance during the economic down turn period (recession phase). If and when data availability improves, future research should examine more specifically the impact of institutional investors on executives' remuneration. Depending on the outcome, future empirical findings may shed light on the question as to whether government regulative agencies should closely monitor corporate behaviours during economic recession to protect investors and other stakeholders.

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Table 1(A). Firm industry breakdown

Industry	N	% of sample
Banks	7	0.04
Capital goods	6	0.04
Commercial services and suppliers	11	0.07
Consumer services	12	0.07
Diversified financials	9	0.06
Energy	15	0.09
Food& staple retailing	3	0.02
Food& beverage & tobacco	3	0.02
health care equipment & services	7	0.04
insurance	4	0.02
Materials	42	0.26
Media	9	0.06
Pharmaceuticals & biotechnology	3	0.02
real estate	10	0.06
Retailing	6	0.04
Software & services	2	0.01
Telecommunication services	5	0.03
Transportation	6	0.04
Utilities	3	0.02

Note: provided here are industry breakdown for our sample of Australian corporations over the period 2003–2007 and 2008-2013, inclusive. Firms are classed into industry groupings based on their 1-digit SIC code.

Table 1(B). International comparison of elasticities

Country	Size elasticity	Study
Canada	0.247	Zhou(2000)
Japan	0.247	Kaplan (1994)
UK	0.261	Cosh (1975)
USA	0.282	Joskow and Rose (1994)
Australia	0.274	Merhebi et al. (2006)

Note: Results presented from international studies demonstrate that the association between pay and size in the Australian context is very similar to that evidenced in the USA, UK, Canada and Japan

Table 3. CEO Remuneration and Firm Performance

Panel A: *CEO remuneration and performance elasticity (2003-2007)*																
Variables	ln(known)				ln(STI)				ln(LTI)				ln(tatotal)			
	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8	Model9	Model10	Model11	Model12	Model13	Model14	Model15	Model16
ln(Assets)	0.157	0.1583	0.1582	0.1652	0.1607	0.1677	0.2032	0.2424	0.2739	0.2662	0.2355	0.2969	0.1611	0.1642	0.164	0.1809
	(6.50***)	(6.50***)	(6.50***)	(6.50***)	(3.40***)	(3.70***)	(4.20***)	(4.80***)	(4.80***)	(4.90***)	(4.20***)	(5.10***)	(7.60***)	(7.90***)	(7.90***)	(8.40***)
ROA	-0.20				0.16				-0.36				0.139			
	(-0.10)				(4.80***)				(-1.00)				(1.10)			
ROE		-0.0734				0.12				-0.13				0.0487		
		(-0.9)				(7.7***)				(-0.7)				(0.7)		
TSR			0.0042				0.11				0.2175				0.0291	
			(0.2)				(1.7*)				(3.5***)				(1.2)	
TQ				0.0048				0.156				0.13				0.0079
				(1.1)				(1.8*)				(1.9**)				(2.1**)
intercept	10.33	10.28	10.28	10.12	9.27	9.04	8.42	7.62	6.86	7.02	7.53	6.31	11.03	10.97	10.97	10.61
R squared	0.72	0.72	0.72	0.72	0.8	0.81	0.8	0.79	0.63	0.62	0.64	0.63	0.81	0.8	0.81	0.81
F-statistic	10.25	10.26	10.28	10.38	15.39	16.51	14.64	14.87	6.72	6.71	6.83	6.81	16.28	16.27	16.19	16.51
Prob (F-statistic)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
N	779	779	779	779	779	779	779	779	777	779	779	779	777	777	777	777

*Note: **Panel A** presents the results of regressing the natural logarithm of total CEO compensation, or a component thereof, on lagged values of firm size, proxied by the natural logarithm of total assets, and firm performance (proxied by ROE, ROA, TSR and TQ) for our sample of ASX 200 over the period 2003-2007, inclusive. Ln (CEO compensation) is equal to the natural logarithm of either total compensation or a component thereof, with other variables as defined in Table 1. To ensure ease of interpretation of results, while compensation is expressed in dollars, the value of a firm's total assets is expressed in thousands of dollars. This table also reports the adjusted R^2, F-statistics and its associated P-value and number of firm-year observations (N). T-statistics are given in parentheses, with *, **, and *** denoting significance at the 10%, 5%, and 1% levels, respectively*

Table 3. CEO Remuneration and Firm Performance

Panel A: *CEO remuneration and performance elasticity (2003-2007)*																
Variables	ln(known)				ln(STI)				ln(LTI)				ln(tatotal)			
	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8	Model9	Model10	Model11	Model12	Model13	Model14	Model15	Model16
ln(Assets)	0.157	0.1583	0.1582	0.1652	0.1607	0.1677	0.2032	0.2424	0.2739	0.2662	0.2355	0.2969	0.1611	0.1642	0.164	0.1809
	(6.50***)	(6.50***)	(6.50***)	(6.50***)	(3.40***)	(3.70***)	(4.20***)	(4.80***)	(4.80***)	(4.90***)	(4.20***)	(5.10***)	(7.60***)	(7.90***)	(7.90***)	(8.40***)
ROA	-0.20				0.16				-0.36				0.139			
	(-0.10)				(4.80***)				(-1.00)				(1.10)			
ROE		-0.0734				0.12				-0.13				0.0487		
		(-0.9)				(7.7***)				(-0.7)				(0.7)		
TSR			0.0042				0.11				0.2175				0.0291	
			(0.2)				(1.7*)				(3.5***)				(1.2)	
TQ				0.0048				0.156				0.13				0.0079
				(1.1)				(1.8*)				(1.9**)				(2.1**)
intercept	10.33	10.28	10.28	10.12	9.27	9.04	8.42	7.62	6.86	7.02	7.53	6.31	11.03	10.97	10.97	10.61
R squared	0.72	0.72	0.72	0.72	0.8	0.81	0.8	0.79	0.63	0.62	0.64	0.63	0.81	0.8	0.81	0.81
F-statistic	10.25	10.26	10.28	10.38	15.39	16.51	14.64	14.87	6.72	6.71	6.83	6.81	16.28	16.27	16.19	16.51
Prob (F-statistic)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
N	779	779	779	779	779	779	779	779	777	779	779	779	777	777	777	777

Note: **Panel A** presents the results of regressing the natural logarithm of total CEO compensation, or a component thereof, on lagged values of firm size, proxied by the natural logarithm of total assets, and firm performance (proxied by ROE, ROA, TSR and TQ) for our sample of ASX 200 over the period 2003-2007, inclusive. Ln (CEO compensation) is equal to the natural logarithm of either total compensation or a component thereof, with other variables as defined in Table 1. To ensure ease of interpretation of results, while compensation is expressed in dollars, the value of a firm's total assets is expressed in thousands of dollars. This table also reports the adjusted R^2, F-statistics and its associated P-value and number of firm-year observations (N). T-statistics are given in parentheses, with *, **, and *** denoting significance at the 10%, 5%, and 1% levels, respectively

Table 3 continued

Variables	ln(known)				ln(STI)				ln(LTI)				ln(tatotal)			
	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8	Model9	Model10	Model11	Model12	Model13	Model14	Model15	Model16
ln(Assets)	0.2152	0.2203	0.2445	0.2937	-0.3089	-0.0241	0.2028	0.58	0.21	0.224	0.251	0.2873	0.1899	0.2031	0.224	0.2396
	(6.3***)	(6.5***)	(7***)	(6.4***)	(-1)	(-0.1)	(0.6)	(1.7*)	(2.7***)	(3.0***)	(3.5***)	(3.8***)	(5.8***)	(6.3***)	(7***)	(7.1***)
ROA	0.68				19.1096				0.17				1.2561			
	(2.2**)				(6.4***)				(2.6***)				(4.1***)			
ROE		0.3994				6.9416				0.11				0.6221		
		(2.3**)				(4.2***)				(2.1**)				(3.7***)		
TSR			-0.0468				0.001				0.00006				0.0002	
			(-0.7)				(1.8*)				(0.5)				(0.4)	
TQ				-0.0122				0.43				0.0424				0.0182
				(-0.9)				(3.4***)				(1.5)				(1.4)
intercept	9.16	9.05	8.8	9.05	16.12	10.43	6.45	-2.42	8.51	8.09	7.6	6.75	10.44	10.17	9.8	9.43
R squared	0.75	0.75	0.74	0.74	0.42	0.42	0.42	0.43	0.7	0.7	0.69	0.69	0.8	0.8	0.8	0.8
F-statistic	14.56	14.57	14.46	14.47	3.11	3.11	3.11	3.11	11.35	11.3	11.21	11.26	19.85	19.75	19.32	19.38
Prob(F-statistic)	0.00	0.00	0.00	0.00	0.12	0.14	0.12	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N	936	936	936	936	936	936	936	936	936	936	936	936	936	936	936	936

*Note: **Panel B** presents the results of regressing the natural logarithm of total CEO compensation, or a component thereof, on lagged values of firm size, proxied by the natural logarithm of total assets, and firm performance (proxied by ROE, ROA, TSR and TQ) for our sample of ASX 200 over the period 2008-2013, inclusive. Ln (CEO compensation) is equal to the natural logarithm of either total compensation or a component thereof, with other variables as defined in Table 1. To ensure ease of interpretation of results, while compensation is expressed in dollars, the value of a firm's total assets is expressed in thousands of dollars. This table also reports the adjusted R^2, F-statistics and its associated P-value and number of firm-year observations (N). T-statistics are given in parentheses, with *, **, and *** denoting significance at the 10%, 5%, and 1% levels, respectively*

Table 4. CEO-Pay Vs Shareholders Value

Panel A: Pay-shareholder value sensitivity								
	2003-2007				**2008-2013**			
	Model1	**Model2**	**Model3**	**Model4**	**Model1**	**Model2**	**Model3**	**Model4**
Variables	Δ known	Δ STI	Δ LTI	Δ total	Δ known	Δ STI	Δ LTI	Δ total
Δ MktCap	0.009	0.0811	0.0752	0.1551	-0.000006	0.0918	0.1732	0.1906
	(1.23)	(3.34**)	(4.25***)	(3.14***)	(-0.6)	(2.5***)	(5.7***)	(8.1***)
intercept	20871.06	62366	55085	138323	37079	-30009	32853	39925
R-Squared	0.099	0.15	0.09	0.08	0.04	0.56	0.63	0.13
F-statistics	2.33	0.53	0.3	3.29	0.19	13.2	18.2693	32.5
Prob (F-statistic)	1.0	0.9	0.003	0.041	1	0.036	0.001	0.025
N	623	623	623	623	780	780	780	780
Panel B: Pay-shareholder value elasticity								
	2003-2007				**2008-2013**			
	Model5	**Model6**	**Model7**	**Model8**	**Model5**	**Model6**	**Model7**	**Model8**
Variables	Δ ln known	Δ ln STI	Δ ln LTI	Δ ln total	Δ ln known	Δ ln STI	Δ ln LTI	Δ ln total
Δ ln Mkt Cap	0.0481	0.8013	0.8738	0.1972	-0.013	0.756	0.8903	0.2139
	(6.75**)	(8.6***)	(12.75***)	(3.52***)	(-0.27)	(4.95***)	(3.27***)	(3.75***)
intercept	0.0827	0.04	0.137	0.1036	0.059	-0.31	0.013	0.0313
R-Squared	0.06	0.077	0.075	0.62	0.085	0.09	0.099	0.45
F-statistics	0.1782	0.2497	6.28	12.23	0.37	25.2369	18.2356	16.232
Prob (F-statistic)	1	1	0.002	0.00	1	0.00	0.02	0.00
N	623	623	623	623	780	780	780	780

Note: Table 4 presents the results of regressing measures of the change in CEO pay on contemporaneous market performance measures for our sample of ASX 200 over the period 2003-2007 and 2008-2013, inclusive. Variables are defined as follows: ΔCEO pay is the change in either total compensation or a component thereof, between years t-1 and t; Δln (CEO Pay) is the change in the natural logarithm of either total compensation or a component hereof between years t-1 and t; Δ MktCap is equal to the change in market capitalization between years t-1 and t and Δ ln MktCap represents the change in the natural logarithm of market capitalization between years t-1 and t. To ensure ease of interpretation of results, while compensation is expressed in dollars, market capitalization is expressed in thousands of dollars. This table also reports the R2, F-statistic and its associated P-value and number of firm-year observations. T-statistics are given in parentheses, with,**, and *** denoting significance at the 10%, 5%, and 1% levels, respectively.*

Table 5. International comparison of pay-performance elasticities

Country	Performance sensitivities	Performance elasticities	Study
USA	$3.25		Jensen and Murphy (1990)
Korea	$3.02		Kato et al,. (2007)
UK	$3.12		Ozkan (2011)
Australia	$0.20	0.12%	Merhebi et al,. (2006)
USA		0.15%	Rosen (1992)
UK		0.10%	Rosen (1992)
Australia	$0.15	0.14%	Schultz et al,. (2013)
Canada	$2.25	0.16%	Zhou (2000)
Australia	$0.18	0.20%	This study*

*Note: *This is the average of the performance sensitivities and elasticities reported in Table 5 (Panel A and B) for total component of CEO remuneration*

Table 6. Corporate governance and the CEO pay-performance association

Panel A: Pay-performance sensitivity _MrkCap_2008-2013				
Variables	**Δ Known**	**Δ STI**	**Δ LTI**	**Δ Total**
Δ MrkCap	-0.000029	0.00004	0.00010	0.00011
	(-0.056953)	(0.100798)	(0.19458)	(0.11353)
*HighMonitorConc * Δ MrkCap*	-0.000004	-0.00002	0.12001	-0.00003
	(-0.144547)	(-0.770185)	(1.32**)	(-0.470734)
*HighInsiderConc * Δ MrkCap*	0.000029	-0.00004	0.00002	0.00000
	(1.016196)	(-0.81)	(0.52885)	(0.090798)
BordSize	55249.870000	35316.87000	18789.62000	109356.400
	(3.75***)	(2.15***)	(1.24*)	(3.82***)
Duality	18160.730000	26103.38000	22443.83000	14501.18000
	(2.78***)	(4.32***)	(8.20***)	(3.96***)
NED	-127330.200000	-356194.40000	-284222.30000	-767746.80000
	(-0.49582)	(-3.42***)	(-1.84*)	(-3.49***)
RemCom	-219659.000000	-68503.77000	-31177.33000	-319340.10000
	(-3.89***)	(-2.98***)	(-0.218093)	(-4.93***)
CEORemCom	-468.216400	-16232.81000	-16482.15000	-218.87190
	(-1.06688)	(-2.30**)	(-4.22**)	(-0.001621)
*LargeBoard * Δ MrkCap*	0.0725	-0.0625	-0.1801	-0.00004
	(0.584)	(-0.7178)	(-0.21258)	(-0.490742)
*Duality * Δ MrkCap*	-0.000022	0.00002	0.00009	0.00009
	(-0.352909)	(0.44303)	(1.357852)	(0.712357)
*HighNED * Δ MrkCap*	-0.06	0.06525	0.0254	0.00003
	(-1.561059)	(-0.82)	(2.905***)	(0.391193)
RemCom Δ MrkCap*	-0.01	0.00000854	-0.0528	0.00003
	(0.191122)	(0.022303)	(2.1535**)	(0.026455)
*CeoRemCom * Δ MrkCap*	-0.05	0.0394	-0.06258	-0.1216
	(-1.199827)	(1.623**)	(-2.42***)	(-2.549***)
Intercept	-666686.1	-58686.1	-344791.00000	-1567567.00000
R squared	0.0529830	0.04397	0.02388	0.05928
F-statistic	2.5950870	2.13352	1.13496	2.92308
Prob(F-statistic)	0.0016330	0.01109	0.325852	0.00039
N	617	617	617	617

*Note: Panel A presents the results of regressing measures of the change in CEOpay on contemporaneous market performance and corporate governance measures for our sample of ASX 200 over the period 2008-2007 inclusive. HighMonitorConc, HighInsiderConc, LargeBoard, and HighNED are dummy variables equal to one if MonitorBlock, InsiderBlock, BoardSize, and NED, respectively are greater than the 1-digit SIC industry median, and zero otherwise. All other variables are as defined in the text, with HighMonitorConc*ΔMktCap, HighInsiderConc*ΔMktCap, LargeBoard*ΔMktCap, Duality*ΔMktCap, HighNED*ΔMktCap, RemComm*ΔMktCap, and CeoRemComm*ΔMktCap representing interaction terms. To ensure ease of interpretation of results, while compensation is expressed in dollars, market capitalization is expressed in thousands of dollars. This table also reports the R^2 , F-statistic, P-value of F-statistic and number of firm-year observations. T-statistics are given in parentheses, with *, **, and *** denoting significance at the 10%, 5%, and 1% levels, respectively*

Table 6. Corporate governance and the CEO pay-performance association

Panel B: Pay-performance sensitivity _MrkCap_2003-2007				
Variables	**Δ Known**	**Δ STI**	**Δ LTI**	**Δ Total**
Δ MrkCap	0.004549	0.0634	0.04218	0.1303
	(0.625)	(2.95***)	(4.25***)	(4.4882***)
*HighMonitorConc * Δ MrkCap*	0.000003	0.0315	0.2150	0.095
	(0.130113)	(0.48)	(2.65***)	(3.04***)
*HighInsiderConc * Δ MrkCap*	0.000025	0.1852	-0.4213	-0.00002
	(1.063539)	(5.258***)	(-3.05***)	(-0.568995)
BordSize	17195.660000	22530.55000	6067.64000	45793.85000
	(3.25***)	(2.85***)	(1.24*)	(3.65***)
Duality	4590.122000	57796.10000	34720.93000	87926.91000
	(2.25***)	(4.01***)	(7.63***)	(2.86***)
NED	-272395.700000	-30072.79000	-163834.50000	-138634.00000
	(-0.49582)	(-4.02***)	(-2.34*)	(-3.62***)
RemCom	-1594440.000000	-135629.30000	71253.79000	-1387557.00000
	(-4.04***)	(-3.38***)	(0.218093)	(-2.323**)
CEORemCom	-23143.550000	-41192.41000	-8231.30500	-72567.27000
	(-0.302305)	(-0.626887)	(-0.130512)	(-0.629443)
*LargeBoard * Δ MrkCap*	0.05854	0.12005	-0.1705	0.00002
	(3.193***)	(1.78*)	(-4.49***)	(-0.035442)
*Duality * Δ MrkCap*	-0.000032	-0.00010	0.00018	0.00004
	(-0.248200)	(-0.905942)	(1.639213)	(0.215577)
*HighNED * Δ MrkCap*	-3.47E-05	-4.20E-05	0.0529	0.00001
	(-0.757905)	(-1.070355)	(2.30***)	(0.148533)
RemCom Δ MrkCap*	4.51E-03	-2.35E-04	-0.00013	0.00415
	(0.575515)	(-0.45851)	(-0.26884)	(0.622)
*CeoRemCom * Δ MrkCap*	0.612	-1.55E-05	0.00004	0.00007
	(0.889)	(-0.732673)	(0.8601)	(0.8549)
Intercept	1525962	-16179.22	146774.200	1656557.000
R squared	0.0796250	0.03517	0.07224	0.07108
F-statistic	5.0377780	2.12258	4.53395	4.45605
Prob(F-statistic)	0.0000000	0.01132	0	0.00000
N	771	771	771	771

Note: Panel B presents the results of regressing measures of the change in CEOpay on contemporaneous market performance and corporate governance measures for our sample of ASX 200 over the period 2003-2007 inclusive. HighMonitorConc, HighInsiderConc, LargeBoard, and HighNED are dummy variables equal to one if MonitorBlock, InsiderBlock, BoardSize, and NED, respectively are greater than the 1-digit SIC industry median, and zero otherwise. All other variables are as defined in the text, with HighMonitorConc*ΔMktCap, HighInsiderConc*ΔMktCap, LargeBoard*ΔMktCap, Duality*ΔMktCap, HighNED*ΔMktCap, RemComm*ΔMktCap, and CeoRemComm*ΔMktCap representing interaction terms. To ensure ease of interpretation of results, while compensation is expressed in dollars, market capitalization is expressed in thousands of dollars. This table also reports the R^2, F-statistic, P-value of F-statistic and number of firm-year observations. T-statistics are given in parentheses, with *, **, and *** denoting significance at the 10%, 5%, and 1% levels, respectively.