

Towards a Set of Design Principles for Executive Compensation Contracts

Executive compensation has been controversial for many years. Controversies over executive pay have sparked outrage from some sectors and calls for increased regulation and reform. Yet others argue that knee jerk reactions to perceived abuses of pay can lead to a host of unintended and inefficient outcomes. This paper argues that much of this controversy is due to executives being rewarded via contracts that have weaknesses in design. We argue that few stakeholders in firms would object to generous compensation for managers whose performance results in abnormally high long term shareholder wealth creation. We state a set of principles, developed from a review of the extensive theoretical, regulatory, and empirical literature, that we offer as fundamental building blocks for designing executive remuneration systems in public firms, especially where ownership and control are separated. Our purpose is to generate broad debate and discussion leading to a consensus as to the principles that should be present in all executive compensation contracts such that the interests of shareholders and managers are more closely aligned.

Key words: Design principles; Executive compensation.

CEO compensation is controversial. While some examples of CEO misbehaviour are quite recent and thus well-remembered,¹ Murphy (2013) demonstrates that CEO pay was controversial in the US even before the Great Depression of the 1930s, while Frydman and Sacks (2010) provide historical comparisons of median CEO pay relative to an average worker for the period 1936–2005.

CEOs of public companies are routinely perceived to be overpaid and their boards are perceived to provide poor monitoring and control of powerful executives. There are three elements to these complaints (Kaplan, 2013): (a) CEOs are overpaid and their pay keeps increasing; (b) CEO pay is not linked to performance; and (c) corporate boards are ineffective monitors. Bebchuk and Fried (2005, p. 2)

¹ For example, the Enron and WorldCom collapse, the US option backdating scandal of the early 2000s, high risk lending in the US residential real estate market, and compensation systems that encouraged excessive risk taking in financial institutions, which led, among many other factors, to the GFC, and termination payments that were perceived to be overly generous.

claim that ‘flawed compensation arrangements have not been limited to a small number of “bad apples”; they have been widespread, persistent, and systemic’.

The US regulatory response to the Enron and WorldCom collapses (among many high profile failures) was to introduce far-reaching corporate governance reforms in the Sarbanes-Oxley legislation of 2002, while the Dodd-Frank legislation of 2010 followed the global financial crisis (GFC). Dodd-Frank requires that, among many other things, all public companies obtain an annual advisory shareholder vote on top executive pay.² The Australian response to perceived abuses of termination payments resulted in amendments to the *Corporations Act 2001* that restrict giving benefits greater than one year’s base salary on retirement from a board or managerial office, unless shareholders approve the benefit. Australian remuneration rules were also recently, and many argue controversially, amended to introduce the ‘two strikes’ rule, which became effective from 1 July 2011.³ Under this rule, if 25% of shareholders at a company’s annual general meeting (AGM) vote against the company’s remuneration report the first time, directors are put on notice to review their remuneration policies. The second and final strike is delivered if, at the following year’s AGM, 25% of shareholders again vote against the remuneration report. Further, if at least 50% of shareholders present at the meeting vote for a board spill, directors must face re-election within 90 days.⁴ However, whether these regulatory reforms will achieve their intentions without severe unintended consequences remains somewhat clouded. A central theme of Murphy’s (2013) paper is that the history of regulatory intervention in CEO pay in the US suggests that unintended consequences abound.

We argue that much of this controversy is due to executives being rewarded via contracts that have weaknesses in design. We argue that few stakeholders in firms would object to generous compensation for managers whose performance results in abnormally high long-term shareholder wealth creation. We state a set of principles, developed from a review of the extensive theoretical, regulatory, and empirical literature, that we suggest should be the fundamental building blocks for designing executive remuneration systems in public firms, especially where ownership and control is separated. Our purpose is to generate broad debate and discussion, hopefully leading to a consensus as to the principles that should be present in all executive compensation contracts such that the interests of shareholders and managers are better aligned.

² Kaplan (2013) shows that top executive pay policies of S&P 500 and Russell 3000 companies received majority shareholder support in 98% of the Dodd Frank mandated ‘Say On Pay’ votes in 2011.

³ The *Corporations Amendment (Improving Accountability on Director and Executive Remuneration) Act 2001* (Cth).

⁴ Lee and Shan (2014) have a current research project on the two strikes rule in Australia. They find that, among all ASX listed firms, there were 99 first strikes in 2011, and 124 strikes in 2012. Of these firms 23 had two strikes in 2012. Their preliminary results also show that the market reaction following the AGM meeting for a ‘first strike’ in 2011 was negative and significant.

THEORIES OF EXECUTIVE COMPENSATION

There are two main ‘camps’ in relation to CEO compensation and it is quite clear that opinions are dramatically and sometimes heatedly divided.⁵ One group of researchers, the efficient-contracting camp, argues and finds that CEO compensation is set in a competitive equilibrium with appropriate incentive structures to motivate managers to maximize shareholder wealth. The other dominant group, the managerial-power camp, argues that CEO compensation is set through managers exercising power over ineffective boards of directors. The two groups engage in robust debate, though occasionally this becomes somewhat inflamed.

Murphy (2013) suggests that any discussion of CEO compensation that ignores developments in government regulatory and tax policy in relation to the CEO pay controversy is likely to ignore an important aspect of the way in which executive pay, particularly in the US, has evolved. Thus a third aspect of executive compensation considers regulatory issues and, in particular, some of the unintended consequences of regulatory reform of CEO remuneration. Finally, CEOs are subject to the laws of the land, and these laws spell out the legal obligations of executives of corporations. It is interesting to note that both Australian and US corporations law⁶ requires that directors and officers put the interests of the corporation before their own interests.

Efficient-contracting Theories

The efficient-contracting camp, with its theoretical roots in optimal-contracting theory, maintains that the ‘observed level and composition of compensation reflects a competitive equilibrium in the market for managerial talent, and that incentives are structured to optimize firm value’ (Murphy, 2013, p. 214). One often-discussed benefit of equity-based compensation is that it can reduce agency costs associated with the separation of ownership and control (see, Berle and Means (1932) and Jensen and Meckling (1976)) by better aligning the incentives of the CEO with those of the shareholders. Smith and Watts (1982) describe long-term incentive plans as a means whereby agency costs can be controlled, in particular, costs associated with a manager’s risk aversion. Managers have a substantial portion of their wealth tied up in the firms they manage and hence they hold a portfolio with

⁵ Bertrand (2009) reviews three main explanations: a principal agent view; a rent extraction view; and a market based view. The market based view argues that ‘the market has played an increasingly important role in setting CEO compensation because a growing share of CEOs are externally recruited as the demand for CEOs shifts away from firm specific skills toward more general skills. This shift has intensified the competition among firms for managerial talent, resulting in higher equilibrium compensation in the CEO market’ (Bertrand, 2009, p. 117). The market based view can be considered part of the efficient contracting perspective.

⁶ The US business judgement rule specifies that the court will not review the business decisions of directors who performed their duties: (a) in good faith; (b) with the care that an ordinarily prudent person in a like position would exercise under similar circumstances; and (c) in a manner the directors reasonably believe to be in the best interests of the corporation. The Australian *Corporations Act 2001* (s 180) contains similar provisions.

considerable exposure to firm-specific (idiosyncratic) risk. This may cause them to be risk averse in their investment and financing decisions for the firms they manage. Shareholders, on the other hand, can easily diversify away from such firm-specific risks and hence want to encourage managerial risk taking. One way in which this conflict can be reduced is to tie management compensation to firm performance, thus motivating managers to make shareholder value-increasing decisions and improving pay–performance sensitivity (see also, Hölmstrom, 1979; Harris and Raviv, 1979; Grossman and Hart, 1983; Smith and Stulz, 1985).

Hirshleifer and Suh (1992) argue that option-based managerial compensation can reduce agency costs associated with both risk aversion and incentives to reduce effort. Consequently, shareholders would prefer the composition of executive remuneration to contain more equity-linked payments than cash payments. However, it needs to be remembered that the value a CEO places on a share of restricted stock or the grant of an executive option ‘will be strictly less than the fair market value of the share’ (Murphy, 2013, p. 229).

Shleifer and Vishny (1997) argue that in the case of incomplete contracting where managers have more information than outsiders (i.e., analysts and shareholders) managers have residual control rights that provide incentives for self-interested behaviour. Long-term equity-based compensation offers one solution to this problem, so that firm performance is positively affected when managers are granted equity-based compensation.

Managerial-power Theories

The managerial-power camp argues that both the level and composition of CEO pay is determined through managers exercising their power over captive boards. A series of papers by Yermack (1995, 1997, 2006a, 2006b, 2009), Bebchuk and Fried (2003, 2004, 2006), Bebchuk *et al.* (2002, 2010) and Bebchuk and Grinstein (2005) exemplify this view. Yermack (1995) finds that few agency and financial contracting theories have explanatory power for patterns of CEO stock option awards, while Yermack (2006a) focuses on a CEO’s personal use of corporate jets, finding that firms that disclose this managerial benefit underperform by more than 4% annually. An initial disclosure announcement share price effect of -1.1% is documented. Yermack (2006b) studies the severance pay of 179 CEOs who left Fortune 500 firms, showing that more than half receive severance pay worth on average \$US5.4 million. A large majority of this severance pay is made on a discretionary basis by the board of directors, not in accord with the CEO’s employment contract. Yermack (2009) samples 1,013 major gifts by CEOs to their family foundations between 2003 and 2005 and finds that CEOs make their gifts just before their stock price falls, maximizing their income tax refunds.

Bebchuk *et al.* (2002) and Bebchuk and Fried (2003) argue that managerial power and rent extraction are likely to have an important influence on the design of executive compensation contracts, while Bebchuk and Fried (2006) argue a similar case for managerial capture. Their 2006 book provides a ‘detailed account of how corporate boards have failed to negotiate with executives and how pay practices have decoupled compensation from performance, leading to practices that dilute

manager incentives and hurt shareholders' (Bebchuk and Fried, 2006, p. 2). They argue that making board decision making at arm's length from the power of CEOs is tortuous and that substantial additional corporate governance reform is necessary to give shareholders greater scrutiny over boards, and boards greater control over CEOs. Bebchuk and Fried (2004) show that US boards have been able to camouflage substantial amounts of executive remuneration through the use of payments made on retirement of executives.

Bebchuk *et al.* (2010) study the timing of CEO option grants, a topic that has been subject to considerable SEC legal action, resulting in dozens of US CEOs and directors being forced to resign. They find (p. 2364):

Overall, our analysis provides support for the view that opportunistic timing practices reflect governance breakdowns and raise governance concerns. In particular, we find that: opportunistic timing was correlated with factors associated with greater CEO influence on corporate decision making, such as a lack of a majority of independent directors or a long serving CEO; grants to independent directors were also opportunistically timed, and this timing was not merely a byproduct of simultaneous awards to executives or of firms routinely timing all option grants; and lucky grants to independent directors were associated with more CEO luck and CEO compensation.

Bebchuk and Grinstein (2005) examine the growth of US executive pay during the period 1993–2003. They show that pay increased by substantially more than can be explained by changes in firm size, performance, and industry classification. Mean compensation in 2003 would have been only about half of its actual size had the relationships that existed in 1993 been maintained. Equity-based compensation increased considerably for both new-economy and old-economy firms; this growth was not accompanied by a reduction in non-equity rewards.

Unintended Regulatory Consequences

Murphy (2013) comprehensively reviews the evolution of executive pay in the US with a particular emphasis on the role of government intervention. He argues that the 'efficient-contracting' and 'managerial-power' camps are not mutually exclusive. As an example, he argues that a series of papers (Murphy, 2002, 2003; Hall and Murphy, 2003) show that the escalation of option grants in the 1990s was because boards and executives (erroneously) regarded option grants as being free. Murphy (2013) argues that treating the two theories (efficient contracting and managerial power) of managerial compensation as competing hypotheses has not been productive, because they ignore critical political, tax, accounting, and other influences on managerial pay. In Section 3 of his paper, Murphy (2013) develops the central theme of his study, namely that government intervention has been 'both a response to and a major driver of time trends in executive compensation over the past century, and that any explanation for pay that ignores political factors is critically incomplete' (Murphy, 2013, p. 249). This review spans the controversy over executive compensation and the regulatory responses from the 30 years before the Great Depression, during the Great Depression of the 1930s, during the rise (and fall) in the use of restricted stock options between 1950 and 1969, during the wage and price controls that existed in the economic stagnation of the US from 1970 to 1982, the

development of the market for corporate control in the period 1983–1992, the stock option explosion of 1992–2001, the accounting and backdating scandals of 2001–2007, pay restrictions imposed during Treasury’s troubled asset relief program (TARP) recipients during 2008–2009 and the Dodd-Frank Executive Compensation Reform Act from 2010–2011. Murphy (2013) provides several instances of: (a) knee-jerk regulatory intervention to isolate perceived abuses in pay having adverse unintended consequences; and (b) reactions to situations where CEOs are perceived to be getting richer while lower-level workers suffer, giving rise to increased disclosure rules, limits on the tax deductability of CEO pay and the wide-ranging pay regulations of the 2010 Dodd-Frank Act. Murphy notes (p. 249) that ‘the demands to reform (or punish) CEO pay are concentrated in “third parties” angry with perceived levels of excessive pay, and not shareholders concerned about insufficient links between pay and performance’. Murphy (2011, abstract) summarizes the legal history of CEO pay regulation in the US as follows:

Over the past 80 years, Congress has imposed tax policies, accounting rules, disclosure requirements, direct legislation, and myriad other rules to regulate executive pay. With few exceptions, the regulations have generally been either ineffective or counterproductive, typically increasing (rather than reducing) CEO pay and leading to a host of unintended consequences, including the explosion in perquisites in the 1970s, golden parachute plans in the 1980s, stock options in the 1990s, and restricted stock in the 2000s.

Legal Perspective

Australian regulations in relation to employment of executives in the private sector are contained primarily in the *Fair Work Act 2009* and the *Corporations Act 2001*, though statutes in relation to discrimination, privacy, and misleading and deceptive conduct are also of relevance. These legal issues are canvassed in a publication by Clayton Utz (2012). The *Corporations Act 2001* (Cth) requires that a company director or other officer exercise their powers and discharge their duties with care and diligence (s. 180). This duty is subject to a business judgement rule that requires a director who makes a business judgement to:

- make the judgement in good faith and for a proper purpose;
- not to have a material personal interest in the subject matter of the judgement;
- inform themselves about the subject matter of the judgement to the extent they reasonably believe to be appropriate;
- rationally believe that the judgement is in the best interests of the corporation.

In addition, directors and other officers of companies must exercise their powers and discharge their duties in good faith in the best interests of the corporation and for a proper purpose (s. 181). They are prohibited from improperly using their position to gain an advantage for themselves or someone else or to cause detriment to the corporation (s. 182) and are prohibited from using information obtained as a consequence of their role with the company to gain an advantage for themselves or someone else or to cause detriment to the corporation (s. 183). These last two provisions also apply to employees of the company.

The *Corporations Act 2001* restricts giving benefits greater than one year’s base salary on retirement from a board or managerial office, unless shareholders approve the

benefit.⁷ These restrictions cover anyone who has been a director of a company at any time during the three previous years and, for listed companies, key members of management and/or the five highest paid executives over the prior 12-month period. In addition, Australian Securities Exchange (ASX) Listing Rules in relation to termination payments apply to companies listed on the exchange. Specifically, a listed company is obliged to ensure that no officer will be entitled to a termination benefit if a change occurs in the shareholding control of the company (Listing rule 10.18) unless such termination payments are agreed by shareholders at a general meeting (Listing rule 10.19).

In essence the legal view is inconsistent with agency-based arguments derived from the economist's assumption of a 'rational economic man'. Agency arguments are based on an assumption that executives will act in their own interests, though the parties they contract with are aware of these incentives and incorporate bonding and monitoring arrangements to control the potential conflict. The legal view, however, states that executives must not act in their own interests and must put the interests of the corporation first.

GLOBAL TRENDS IN EXECUTIVE COMPENSATION

US Evidence

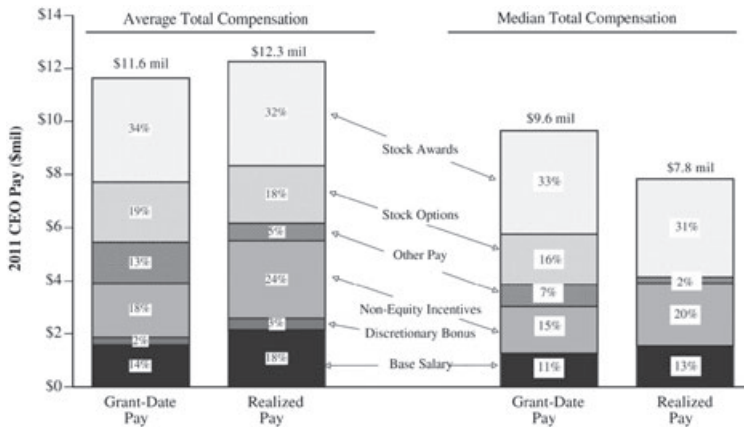
While there are many other papers that describe executive compensation for US executives, we draw on the recent monograph-length paper by Murphy (2013) to provide graphical representations of the current and historical levels of payment to US CEOs in S&P 500 firms. Few would doubt the seminal and on-going contributions that Kevin Murphy has made to the development of executive remuneration, and hence a reliance on his recent work to 'paint the picture' for the US is warranted. Figure A (Murphy, 2013, Figure 1, reproduced with Kevin Murphy's permission) shows mean and median 2011 pay for CEOs of 465 S&P 500 corporations. Several key statistics are worthy of note.

- Average total compensation is estimated at \$11.6 million (based on grant date valuations) or \$12.3 million, based on realized pay. Median compensations, reflecting the considerable skew in executive compensation, are \$9.6 and \$7.8 million respectively.
- The biggest component of executive compensation is associated with stock awards (both restricted stock and performance shares). Stock awards now comprise between 31% and 34% of total mean and median compensation for US CEOs.
- Base salary is between 14% and 18% of mean total compensation, and 11% to 13% of median total compensation.
- Stock options comprise 18% or 19% of mean total compensation, while options grants represent 16% of median grant-date total compensation.
- Non-equity incentive payments, which represent payouts during the current year for the current year and prior year awards, range between 18% and 24% of mean total compensation, and 15% to 20% of median total compensation.

⁷ Retirement is broadly defined to include loss of office and resignation.

FIGURE A

2011 PAY FOR CEOs IN S&P 500 COMPANIES



Note: Figure A is based on proxy statement information compiled in Standard & Poors' ExecuComp database for 465 S&P 500 firms with fiscal closings between June 2011 and May 2012, based on ExecuComp's May 2012 update.

Grant-date Pay:

Base Salary and Discretionary Bonus reflects amounts *actually received for the fiscal year*.

Non-Equity Incentives evaluated at target level (or average of minimum and maximum if target not reported) Stock Options *evaluated at grant date using firm-estimated present value* (typically Black and Scholes (1973) calculations).

Stock Awards *evaluated at grant-date using firm-estimated present value* (typically grant-date market price), including both time-lapse restricted stock and performance shares.

Other Compensation includes perquisites, signing bonuses, termination payments, above-market interest paid on deferred compensation, and the change in the actuarial value of pension benefits.

Realized Pay:

Base Salary and Discretionary Bonus reflects amounts *actually received for the fiscal year*.

Non-Equity Incentives defined as *payouts during the fiscal year* (including payouts on awards made in prior years) Stock Options defined as *gains executive realized by exercising options during the fiscal year*.

Stock Awards defined as *value of awards vesting during the fiscal year* (valued on the date of vesting).

Other Compensation includes perquisites, signing bonuses, termination payments, above-market interest paid on deferred compensation, and pension benefits paid during the year.

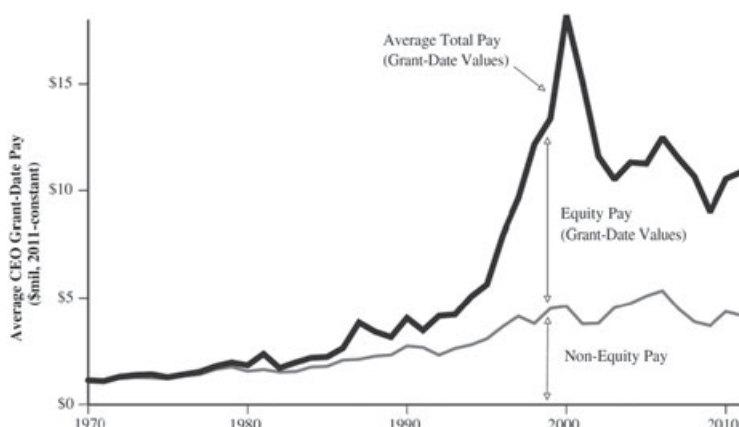
The pay-composition percentages for Average Compensation are calculated as the average ratio of each component to total compensation for each CEO. The composition percentages for Median Compensation are calculated as the median ratio of each component: median ratios do not sum to 100% (because the sum of the medians is not the median of the sum).

Figure B from Murphy (2013, Figure 3, reproduced with permission) shows average total executive compensation for S&P 500 firms for the period from 1970 to 2011 (expressed in 2011 purchasing power) and its division into

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FIGURE B

AVERAGE EQUITY AND NON EQUITY GRANT DATE PAY FOR CEOS IN S&P 500 FIRMS, 1970-2011



Note: Compensation data are based on all CEOs included in the S&P 500, using data from *Forbes* and ExecuComp. CEO total pay includes cash pay, restricted stock, payouts from long-term pay programs, and the value of stock options granted (using company fair-market valuations, when available, and otherwise using ExecuComp's modified Black-Scholes approach). Average (median) equity compensation prior to 1978 estimated based on option compensation in 73 large manufacturing firms (based on Murphy, 1985), equity compensation from 1979 to 1991 estimated as amounts *realized* from exercising stock options during the year, rather than grant-date values. Non-equity incentive pay is based on actual payouts rather than targets, since target payouts were not available prior to 2006. Dollar amounts are converted to 2011-constant dollars using the Consumer Price Index.

equity and non-equity components. Several things are worthy of note, in particular.

- Total pay increased from around \$1.1 million in 1970 to \$10.9 million in 2011, down from a peak of \$18.2 million in 2000. Thus over this 42 year period CEO pay for S&P 500 firms outstripped inflation by a factor of approximately 10.
- Non-equity pay, which includes base salaries, payouts from short-term and long-term bonus plans, deferred compensation and other benefits, increased from around \$1.1 million in 1970 to approximately \$4.1 million in 2011. Thus non-equity pay increases outstripped CPI adjustments by a factor of approximately four.
- The growth in equity-linked pay, which includes the grant date values of stock options and restricted stock, is far more dramatic. In the period 1970 to 1978 total pay is almost entirely comprised of non-equity pay. However, by 2011 equity pay averages around \$6.8 million or about two-thirds of average total pay.
- While it is not claimed to be causal, it is interesting to note that just a few years after Jensen and Meckling's (1976) paper on agency theory, the switch toward the use of equity pay as part of CEO compensation starts to emerge. By 1998 equity pay became the majority part of total executive compensation, and this is maintained in each year through to 2011.
- However, as noted by Kaplan (2013, p. 9), while CEOs 'earn a great deal, they are not unique. Other groups with similar backgrounds—private company executives,

corporate lawyers, hedge fund investors, private equity investors, and others— have seen significant pay increases where there is a competitive market for talent and managerial power problems are absent.’

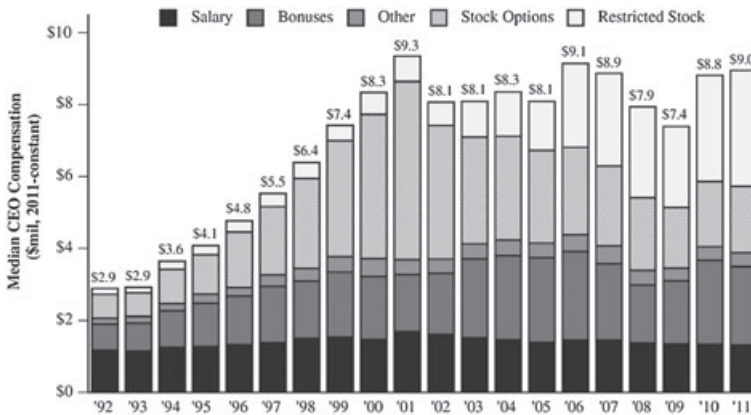
Figure C (Murphy, 2013, Figure 4, reproduced with permission) highlights important trends in both the composition and level of median grant-date pay for CEOs over the years 1992–2011. Of note are the following points.

- Median total pay in Figure C in each year is significantly below mean pay, reflecting the skewness in pay distributions for US CEOs.
- Much of the growth in median total pay between 1992 and 2011 is due to an escalation in stock-option compensation between 1993 and 2001 coupled with a dramatic shift away from stock option grants towards restricted stock from between 2002 and 2011.
- In 1992 base salaries were about 41% of the \$2.9 million median total CEO compensation package, while stock options accounted for about 25%. By 2001, base salaries are only about 18% of the median pay package, while options are more than 50%.
- In 2011 about two-thirds of median total pay is in the form of equity-based compensation.

International CEO Pay Trends

Having reviewed growth in CEO payments in the US, the question of whether US executives are paid more than their international counterparts naturally arises. This

FIGURE C
 MEDIAN GRANT DATE COMPENSATION FOR CEOs IN S&P 500 FIRMS, 1992–2011



Note: Compensation data are based on all CEOs included in the S&P 500, using data from ExecuComp. CEO grant-date pay includes cash pay, payouts from long-term pay programs, and the grant-date value of stock and option awards (using company fair-market valuations, when available, and otherwise using ExecuComp’s modified Black-Scholes approach). Monetary amounts are converted to 2011-constant US dollars using the Consumer Price Index.

issue is taken up in a recent paper by Fernandes *et al.* (2013). The paper argues, contrary to widely accepted views in the executive compensation literature, that US CEOs are paid significantly more than those in other nations (see, for example, Murphy, 1999; Bebchuk *et al.*, 2002), and that the US pay ‘premium is economically modest and primarily reflects performance-based pay demanded by institutional shareholders and independent boards’ (Fernandes *et al.* 2013, p. 323). International comparisons of CEO pay are difficult because regulations in relation to pay disclosures are different. An exception is, however, the UK where CEO pay disclosures have been mandated since 1995. While Conyon and Murphy (2000) show that US CEOs earn almost twice UK CEOs in 1997 (after controlling for industry, firm size, and a variety of firm and individual characteristics), Conyon *et al.* (2011) show that the pay premium of US to UK CEOs had fallen to 40% by 2003, and this premium can be further reduced after adjusting for the risk inherent in undiversified CEO equity portfolios. Fernandes *et al.* (2013) use data from 14 countries that required detailed CEO pay disclosures by 2006. Their sample of 1,648 US and 1,615 non-US firms (with revenues greater than \$US1 billion) comprises nearly 90% of the 2006 market capitalization of publicly listed firms in these countries. They show that US CEOs earn an average of 26% more than their foreign equivalents in 2006, far lower than that documented in prior academic research. Their experiment controls for ownership and board structure (US firms tend to have higher institutional ownership and more independent boards) in addition to the usual firm-specific attributes (size, industry, stock price volatility, and performance and growth opportunities) and CEO characteristics (age, tenure, education, and past experience). Figures 1 and 2 from Fernandes *et al.* (2013) provide the main features of their findings, which can be summarized as below.

- When controls for only firm size and industry are considered, US CEOs earn substantially more than non-US CEOs. When additional controls for other firm characteristics, ownership, and board characteristics are included, US CEOs have effective parity in pay levels with other Anglo-Saxon nations (UK, Ireland, Australia, and Canada) as well as Germany, Italy, and Switzerland.
- When the results after risk adjustment using the Hall and Murphy (2002) approach are considered, again with controls for only firm size and industry, the US estimated pay using the ‘certainty equivalence’ approach is \$2.1 million, and this is statistically higher than the non-US pay of \$1.46 million. When additional controls are introduced the results show that US CEO pay is significantly less than in the UK and Australia, and insignificantly different to CEO pay in Canada, Italy, Ireland, and Switzerland.

Australian CEO Pay

We used the Sirca Limited Corporate Governance database to produce mean and median pay levels for Australian listed firms for the years 2001–2012, as well as the average over all years. The results, which are expressed in December 2012 purchasing power units, are in Tables 1–6 and Figures 1–6. Table 1 covers all firms in the database, a total of 11,282 firm years or an average of 940 firms per year.

TABLE 1
 MEAN AND MEDIAN CEO COMPENSATION FOR ALL FIRMS INCLUDED IN THE SIRCA LIMITED CORPORATE GOVERNANCE DATA-BASE FOR 2001 TO 2012, WHERE ALL DOLLAR VALUES ARE ADJUSTED TO DECEMBER 2012 DOLLARS USING THE AUSTRALIAN CPI

Year	NOB	Mean					Median						
		Cash comp	Cash ratio	Equity comp	Equity ratio	Total comp	Change in total comp From t-1	Cash comp	Cash ratio	Equity comp	Equity ratio	Total comp	Change in total comp From t-1
All	11,282	817,514	78.5%	210,460	20.2%	1,041,461		410,714	87.8%	57,228	12.2%	467,942	
Years													
2001	881	648,519	90.8%	61,092	8.6%	714,343		341,181	96.1%	13,958	3.9%	355,140	
2002	903	701,938	88.9%	86,480	11.0%	789,604	10.5%	355,333	97.7%	8,414	2.3%	363,747	2.4%
2003	914	739,514	85.8%	109,340	12.7%	862,358	9.2%	362,324	94.4%	21,385	5.6%	383,709	5.5%
2004	974	775,085	86.2%	122,884	13.7%	899,062	4.3%	357,455	89.8%	40,650	10.2%	398,105	3.8%
2005	1,006	805,358	82.2%	172,032	17.6%	979,186	8.9%	376,226	87.2%	55,133	12.8%	431,359	8.4%
2006	1,020	829,540	76.2%	217,094	19.9%	1,088,945	11.2%	409,182	84.7%	73,707	15.3%	482,888	11.9%
2007	1,030	924,135	73.4%	325,896	25.9%	1,258,379	15.6%	417,678	80.5%	100,946	19.5%	518,624	7.4%
2008	991	876,693	73.4%	292,323	24.5%	1,194,480	-5.1%	436,681	79.9%	109,597	20.1%	546,278	5.3%
2009	961	909,694	78.4%	244,783	21.1%	1,160,065	-2.9%	448,710	87.0%	67,167	13.0%	515,877	-5.6%
2010	921	844,823	72.8%	298,773	25.8%	1,159,731	0.0%	470,389	85.0%	82,784	15.0%	553,173	7.2%
2011	890	846,664	73.3%	283,934	24.6%	1,155,101	-0.4%	487,491	83.7%	94,874	16.3%	582,365	5.3%
2012	791	890,532	73.6%	303,287	25.1%	1,209,961	4.7%	533,598	82.8%	110,724	17.2%	644,322	10.6%

Notes: Small differences between total compensation and the sum of cash compensation and equity compensation are caused by small amounts of other compensation

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TABLE 2
 MEAN AND MEDIAN CEO COMPENSATION FOR TOP 100 FIRMS INCLUDED IN THE SIRCA LIMITED CORPORATE GOVERNANCE DATABASE FOR 2001 TO 2012, WHERE ALL DOLLAR VALUES ARE ADJUSTED TO DECEMBER 2012 DOLLARS USING THE AUSTRALIAN CPI

Year	NOB	Mean						Median					
		Cash comp	Cash ratio	Equity comp	Equity ratio	Total comp	Change in total comp From $t-1$	Cash comp	Cash ratio	Equity comp	Equity ratio	Total comp	Change in total comp From $t-1$
All	1,200	3,135,036	75.0%	963,287	23.0%	4,180,499		2,358,037	76.6%	721,731	23.4%	3,079,769	
Years													
2001	100	2,333,923	90.8%	234,287	9.1%	2,569,813		1,659,105	91.0%	163,307	9.0%	1,822,413	
2002	100	2,663,347	84.1%	494,395	15.6%	3,168,454	23.3%	1,887,424	80.3%	463,369	19.7%	2,350,792	29.0%
2003	100	2,867,706	77.7%	708,625	19.2%	3,689,757	16.5%	1,952,863	81.0%	457,727	19.0%	2,410,590	2.5%
2004	100	3,458,661	84.4%	636,293	15.5%	4,095,924	11.0%	2,745,374	84.0%	524,813	16.0%	3,270,187	35.7%
2005	100	3,623,498	80.6%	864,354	19.2%	4,495,180	9.7%	2,507,077	82.2%	543,278	17.8%	3,050,356	-6.7%
2006	100	3,404,534	72.4%	973,717	20.7%	4,703,288	4.6%	2,728,890	78.8%	732,984	21.2%	3,461,874	13.5%
2007	100	4,252,072	72.2%	1,573,407	26.7%	5,889,643	25.2%	3,001,960	73.3%	1,094,308	26.7%	4,096,268	18.3%
2008	100	3,636,509	71.1%	1,288,573	25.2%	5,114,690	-13.2%	2,608,688	67.7%	1,243,240	32.3%	3,851,928	-6.0%
2009	100	2,996,897	71.5%	1,178,963	28.1%	4,192,006	-18.0%	2,470,031	72.1%	955,587	27.9%	3,425,618	-11.1%
2010	100	2,938,895	68.2%	1,283,889	29.8%	4,312,291	2.9%	2,396,190	74.7%	812,166	25.3%	3,208,356	-6.3%
2011	100	2,900,287	69.2%	1,183,582	28.2%	4,190,639	-2.8%	2,611,368	75.5%	848,309	24.5%	3,459,677	7.8%
2012	100	2,544,108	67.9%	1,139,360	30.4%	3,744,298	-10.7%	1,822,967	68.8%	826,889	31.2%	2,649,856	-23.4%

Notes: Small differences between total compensation and the sum of cash compensation and equity compensation are caused by small amounts of other compensation

TABLE 3

MEAN AND MEDIAN CEO COMPENSATION FOR TOP 200 FIRMS INCLUDED IN THE SIRCA LIMITED CORPORATE GOVERNANCE DATABASE FOR 2001 TO 2012, WHERE ALL DOLLAR VALUES ARE ADJUSTED TO DECEMBER 2012 DOLLARS USING THE AUSTRALIAN CPI

Year	NOB	Mean					Median					
		Cash comp	Cash ratio	Equity comp	Equity ratio	Total comp	Change in total comp From t-1	Cash comp	Cash ratio	Equity comp	Equity ratio	Total comp
All	2,400	2,241,826	76.9%	627,240	21.5%	2,916,199	1,489,273	81.9%	328,253	18.1%	1,817,526	
Years												
2001	200	1,640,914	89.1%	193,858	10.5%	1,842,285	1,015,393	87.2%	149,579	12.8%	1,164,972	8.0%
2002	200	1,852,749	86.2%	290,161	13.5%	2,148,266	1,166,278	92.7%	92,154	7.3%	1,258,432	22.0%
2003	200	2,064,860	81.6%	409,900	16.2%	2,531,540	1,297,066	84.5%	237,756	15.5%	1,534,821	10.6%
2004	200	2,343,696	85.4%	398,949	14.5%	2,745,960	1,554,318	91.6%	142,934	8.4%	1,697,252	8.6%
2005	200	2,440,173	80.8%	574,346	19.0%	3,021,027	1,628,186	88.3%	214,806	11.7%	1,842,992	13.8%
2006	200	2,480,314	75.3%	648,602	19.7%	3,293,075	1,731,568	82.6%	365,363	17.4%	2,096,931	20.8%
2007	200	2,881,771	72.4%	1,064,460	26.7%	3,982,271	1,812,121	71.5%	721,247	28.5%	2,533,369	20.8%
2008	200	2,505,782	72.0%	867,355	24.9%	3,480,240	1,671,378	72.6%	630,405	27.4%	2,301,783	-9.1%
2009	200	2,576,046	76.7%	771,156	23.0%	3,358,419	1,554,304	76.3%	482,855	23.7%	2,037,159	6.9%
2010	200	2,185,658	71.1%	832,632	27.1%	3,072,018	1,565,365	71.9%	611,972	28.1%	2,177,337	-2.2%
2011	200	2,071,825	71.1%	771,881	26.5%	2,914,515	1,481,272	69.6%	647,142	30.4%	2,128,414	-15.4%
2012	200	1,858,121	71.3%	703,579	27.0%	2,604,775	1,323,633	73.5%	476,189	26.5%	1,799,822	

* Small differences between total compensation and the sum of cash compensation and equity compensation are caused by small amounts of other compensation

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TABLE 4
 MEAN AND MEDIAN CEO COMPENSATION FOR TOP 300 FIRMS INCLUDED IN THE SIRCA LIMITED CORPORATE GOVERNANCE DATABASE FOR 2001 TO 2012, WHERE ALL DOLLAR VALUES ARE ADJUSTED TO DECEMBER 2012 DOLLARS USING THE AUSTRALIAN CPI

Year	NOB	Mean					Median						
		Cash comp	Cash ratio	Equity comp	Equity ratio	Total comp	Change in total comp From t-1	Cash comp	Cash ratio	Equity comp	Equity ratio	Total comp	Change in total comp From t-1
All Years	3,600	1,756,038	76.9%	489,265	21.4%	2,282,457		1,024,675	80.0%	255,833	20.0%	1,280,508	
2001	300	1,302,150	89.6%	142,175	9.8%	1,453,272		736,123	90.0%	82,209	10.0%	818,333	
2002	300	1,464,261	86.6%	223,828	13.2%	1,691,659	16.4%	832,458	93.3%	59,794	6.7%	892,251	9.0%
2003	300	1,606,836	82.9%	291,155	15.0%	1,939,025	14.6%	953,794	93.4%	67,758	6.6%	1,021,552	14.5%
2004	300	1,797,454	85.5%	300,729	14.3%	2,101,774	8.4%	1,055,795	81.8%	234,249	18.2%	1,290,044	26.3%
2005	300	1,893,347	81.4%	428,442	18.4%	2,327,229	10.7%	1,079,181	78.4%	297,651	21.6%	1,376,832	6.7%
2006	300	1,954,341	74.2%	539,941	20.5%	2,635,639	13.3%	1,196,698	78.4%	329,565	21.6%	1,526,263	10.9%
2007	300	2,219,489	72.5%	813,053	26.6%	3,059,856	16.1%	1,167,066	71.9%	456,917	28.1%	1,623,983	6.4%
2008	300	1,958,537	73.0%	647,056	24.1%	2,682,101	-12.3%	1,133,935	72.6%	428,406	27.4%	1,562,341	-3.8%
2009	300	1,990,537	76.2%	613,256	23.5%	2,613,107	-2.6%	1,085,633	76.5%	333,256	23.5%	1,418,889	-9.2%
2010	300	1,732,574	69.3%	726,788	29.1%	2,499,055	-4.4%	1,064,996	72.6%	401,627	27.4%	1,466,623	3.4%
2011	300	1,650,721	71.4%	603,577	26.1%	2,311,992	-7.5%	1,144,030	76.1%	359,916	23.9%	1,503,946	2.5%
2012	300	1,502,209	72.4%	541,179	26.1%	2,074,778	-10.3%	973,203	78.8%	261,887	21.2%	1,235,091	-17.9%

Notes: Small differences between total compensation and the sum of cash compensation and equity compensation are caused by small amounts of other compensation

TABLE 5
 MEAN AND MEDIAN CEO COMPENSATION FOR TOP 101-300 FIRMS INCLUDED IN THE SIRCA LIMITED CORPORATE GOVERNANCE DATABASE FOR 2001 TO 2012, WHERE ALL DOLLAR VALUES ARE ADJUSTED TO DECEMBER 2012 DOLLARS USING THE AUSTRALIAN CPI

Year	NOB	Mean					Median						
		Cash comp	Cash ratio	Equity comp	Equity ratio	Total comp	Change in total comp From t-1	Cash comp	Cash ratio	Equity comp	Equity ratio	Total comp	Change in total comp From t-1
All	2,400	1,066,539	80.0%	252,254	18.9%	1,333,437		769,856	83.1%	156,780	16.9%	926,636	
Years													
2001	200	786,263	87.9%	96,119	10.7%	895,002		622,100	96.7%	21,099	3.3%	643,199	
2002	200	864,718	90.7%	88,544	9.3%	953,262	6.5%	674,713	93.5%	47,179	6.5%	721,892	12.2%
2003	200	976,401	91.8%	82,420	7.7%	1,063,658	11.6%	735,399	93.1%	54,177	6.9%	789,576	9.4%
2004	200	966,851	87.5%	132,947	12.0%	1,104,699	3.9%	786,197	87.6%	110,821	12.4%	897,018	13.6%
2005	200	1,028,272	82.7%	210,486	16.9%	1,243,254	12.5%	796,085	86.9%	119,531	13.1%	915,617	2.1%
2006	200	1,229,245	76.7%	323,053	20.2%	1,601,814	28.8%	847,945	77.7%	243,628	22.3%	1,091,573	19.2%
2007	200	1,203,197	73.1%	432,876	26.3%	1,644,962	2.7%	852,197	73.6%	305,108	26.4%	1,157,306	6.0%
2008	200	1,119,550	76.4%	326,298	22.3%	1,465,807	-10.9%	820,979	79.3%	214,300	20.7%	1,035,279	-10.5%
2009	200	1,487,358	81.6%	330,403	18.1%	1,823,658	24.4%	801,670	75.1%	266,230	24.9%	1,067,900	3.2%
2010	200	1,129,414	70.9%	448,238	28.1%	1,592,437	-12.7%	813,124	74.1%	284,919	25.9%	1,098,042	2.8%
2011	200	1,025,938	74.7%	313,574	22.8%	1,372,669	-13.8%	857,561	73.3%	312,691	26.7%	1,170,252	6.6%
2012	200	981,260	79.1%	242,088	19.5%	1,240,017	-9.7%	806,288	80.2%	199,413	19.8%	1,005,701	-14.1%

Notes Small differences between total compensation and the sum of cash compensation and equity compensation are caused by small amounts of other compensation

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TABLE 6

MEAN AND MEDIAN CEO COMPENSATION FOR NON-TOP 300 FIRMS INCLUDED IN THE SIRCA LIMITED CORPORATE GOVERNANCE DATABASE FOR 2001 TO 2012, WHERE ALL DOLLAR VALUES ARE ADJUSTED TO DECEMBER 2012 DOLLARS USING THE AUSTRALIAN CPI

Year	NOB	Mean					Median					Change in total comp From t-1	
		Cash comp	Cash ratio	Equity comp	Equity ratio	Total comp	Change in total comp From t-1	Cash comp	Cash ratio	Equity comp	Equity ratio		Total comp
All	7,682	377,638	82.1%	79,804	17.4%	459,819		307,142	90.0%	33,958	10.0%	341,100	
Years													
2001	581	311,015	93.5%	19,226	5.8%	332,797		269,132	97.0%	8,439	3.0%	277,570	
2002	603	322,673	94.7%	18,147	5.3%	340,821	2.4%	263,871	98.3%	4,490	1.7%	268,360	-3.3%
2003	614	315,742	93.9%	20,506	6.1%	336,299	-1.3%	273,175	96.7%	9,380	3.3%	282,555	5.3%
2004	674	320,025	88.0%	43,724	12.0%	363,731	8.2%	258,322	93.9%	16,636	6.1%	274,958	-2.7%
2005	706	343,040	84.4%	63,075	15.5%	406,364	11.7%	290,557	89.6%	33,732	10.4%	324,289	17.9%
2006	720	360,873	81.2%	82,574	18.6%	444,489	9.4%	303,974	85.0%	53,449	15.0%	357,424	10.2%
2007	730	391,799	75.6%	125,694	24.3%	518,045	16.5%	315,039	80.8%	74,647	19.2%	389,686	9.0%
2008	691	407,007	74.2%	138,315	25.2%	548,624	5.9%	341,774	85.8%	56,547	14.2%	398,321	2.2%
2009	661	419,145	83.7%	77,549	15.5%	500,591	-8.8%	349,839	90.6%	36,421	9.4%	386,259	-3.0%
2010	621	415,958	81.1%	92,002	17.9%	512,714	2.4%	340,549	85.2%	59,221	14.8%	399,770	3.5%
2011	590	437,822	77.2%	121,404	21.4%	566,851	10.6%	359,734	88.3%	47,447	11.7%	407,181	1.9%
2012	491	516,035	75.8%	157,936	23.2%	680,482	20.0%	379,981	85.2%	65,796	14.8%	445,777	9.5%

Notes Small differences between total compensation and the sum of cash compensation and equity compensation are caused by small amounts of other compensation

FIGURE 1

MEAN AND MEDIAN CEO COMPENSATION FOR ALL FIRMS INCLUDED IN THE SIRCA LIMITED CORPORATE GOVERNANCE DATABASE FOR 2001 TO 2012, WHERE ALL DOLLAR VALUES ARE ADJUSTED TO DECEMBER 2012 DOLLARS USING THE AUSTRALIAN CPI

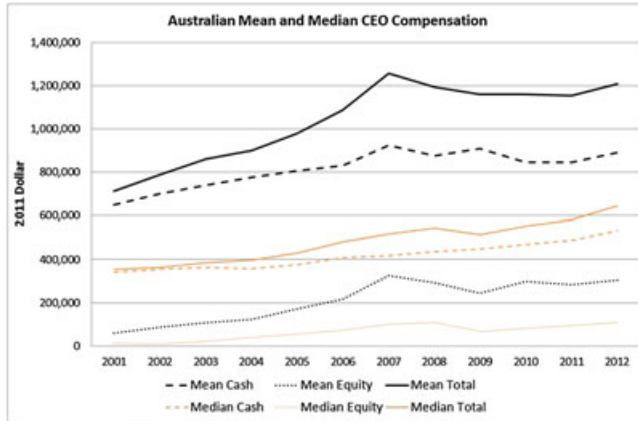


FIGURE 2

MEAN AND MEDIAN CEO COMPENSATION FOR TOP 100 FIRMS INCLUDED IN THE SIRCA LIMITED CORPORATE GOVERNANCE DATABASE FOR 2001 TO 2012, WHERE ALL DOLLAR VALUES ARE ADJUSTED TO DECEMBER 2012 DOLLARS USING THE AUSTRALIAN CPI

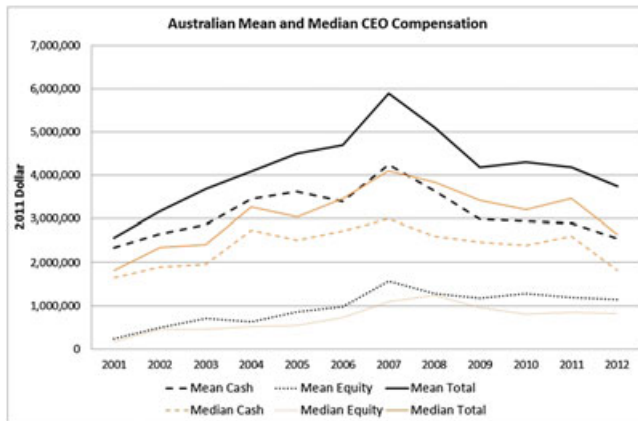


Table 2 relates to the top 100 firms by market capitalization each year, while Tables 3 and 4 cover the top 200 and top 300 firms respectively. Table 5 relates to medium-sized Australian firms, represented by firms in the top 101–300 by market capitalization. Finally, Table 6 covers small listed firms, defined as all firms in the database other than the top 300. A corresponding figure is provided for each of these tables. At this stage we have not attempted to control for firm characteristics nor have we attempted to investigate pay–performance relationships. The Sirca corporate

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FIGURE 3

MEAN AND MEDIAN CEO COMPENSATION FOR TOP 200 FIRMS INCLUDED IN THE SIRCA LIMITED CORPORATE GOVERNANCE DATABASE FOR 2001 TO 2012, WHERE ALL DOLLAR VALUES ARE ADJUSTED TO DECEMBER 2012 DOLLARS USING THE AUSTRALIAN CPI

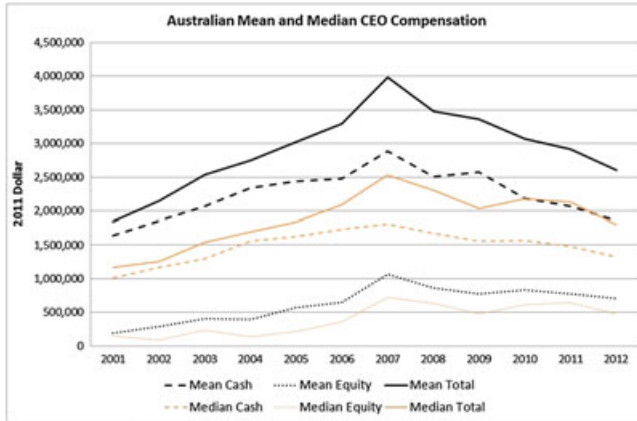
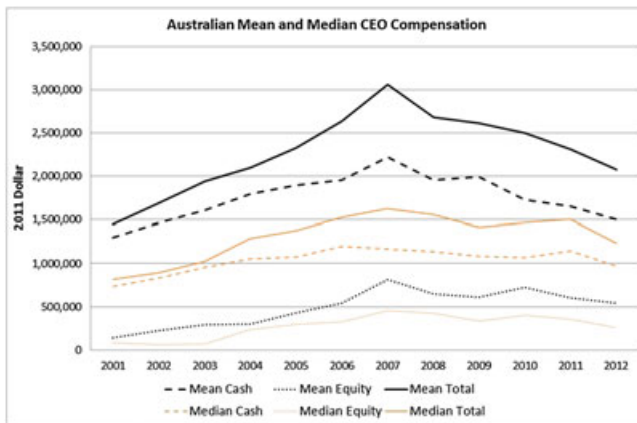


FIGURE 4

MEAN AND MEDIAN CEO COMPENSATION FOR TOP 300 FIRMS INCLUDED IN THE SIRCA LIMITED CORPORATE GOVERNANCE DATABASE FOR 2001 TO 2012, WHERE ALL DOLLAR VALUES ARE ADJUSTED TO DECEMBER 2012 DOLLARS USING THE AUSTRALIAN CPI



governance database captures companies that represent well over 95% of total ASX market capitalization. The following points summarize the main descriptive statistics in Tables 1–6 and Figures 1–6.

- Mean (median) total compensation for the CEOs of all companies in Table 1 grew from \$0.714 million to \$1.210 million (\$0.355 million to \$0.644 million) between

FIGURE 5

MEAN AND MEDIAN CEO COMPENSATION FOR TOP 101 300 FIRMS INCLUDED IN THE SIRCA LIMITED CORPORATE GOVERNANCE DATABASE FOR 2001 TO 2012, WHERE ALL DOLLAR VALUES ARE ADJUSTED TO DECEMBER 2012 DOLLARS USING THE AUSTRALIAN CPI

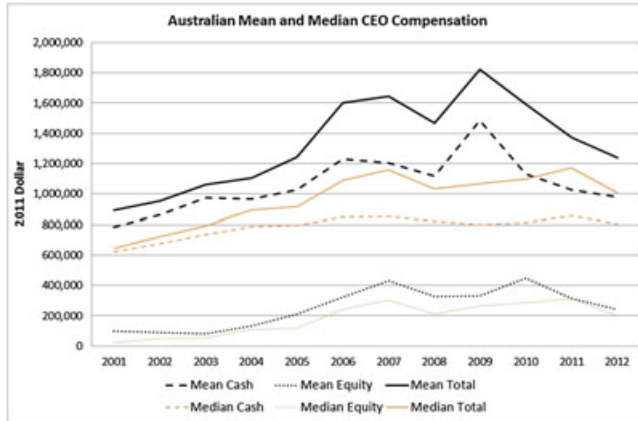
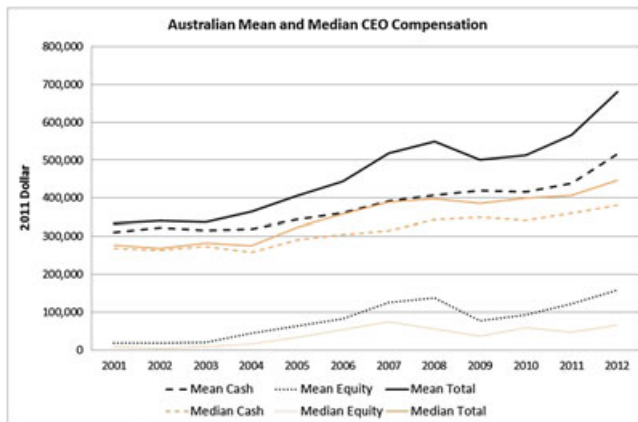


FIGURE 6

MEAN AND MEDIAN CEO COMPENSATION FOR NON TOP 300 FIRMS INCLUDED IN THE SIRCA LIMITED CORPORATE GOVERNANCE DATABASE FOR 2001 TO 2012, WHERE ALL DOLLAR VALUES ARE ADJUSTED TO DECEMBER 2012 DOLLARS USING THE AUSTRALIAN CPI



2001 and 2012. Thus CEO pay has grown faster than the Australian CPI. There is a clear pattern of higher pay for the larger companies. The mean (median) average total compensation over the 12 years are as follows:

- top 100 firms (large firms in Table 2) \$4.180 million and \$3.080 million;
- top 200 firms (Table 3) \$2.916 million and \$1.818 million;
- top 300 firms (Table 4) \$2.282 million and \$1.281 million;

- top 101–300 firms (medium size firms in Table 5) \$1.333 million and \$0.927 million; and
- firms ranked 301 and higher (small firms in Table 6) \$0.460 million and \$0.341 million.
- Equity-based compensation for all firms in Table 1 is 20.2% of mean total compensation and 12.2% of median total compensation over all sample years 2001–2012. Again there is a very clear pattern in relation to firm size, with the proportion of total compensation paid in the form of equity rising as firm size increases. The mean and median proportions of equity compensation to total compensation are as follows from Tables 2–6:
 - the largest firms (top 100)—mean proportion 23.0%, median 23.4%;
 - the largest 200 firms—mean proportion 21.5%, median 18.1%;
 - the largest 300 firms—mean proportion 21.4%, median 20.0%;
 - medium-sized firms (top 101–300)—mean proportion 18.9%, median 16.9%
 - small firms (301 and up)—mean proportion 17.4 percent, median 10.0%.

Thus the equity component of Australian CEO compensation is much lower than in the US, where the equity-based component of total compensation has exceeded 50% in each of the years from 1998.

- There is a clear upward trend in the use of equity-based compensation, with mean (median) proportions in Table 1 for all firms in 2001 being 8.6% (3.9%), with these rising to 25.1 (17.2)% by 2012, respectively. This growth in the use of equity-based compensation is more pronounced for the larger firms than smaller ones. Specifically Tables 2–6 show that between 2001 and 2012 equity forms of compensation as a proportion of total compensation has increased as follows:
 - Table 2 (the largest firms) the growth is from 9.1% to 30.4%;
 - Table 3 (top 200 firms) the growth is from 10.5% to 27.0%;
 - Table 4 (top 300 firms) the growth is from 9.8% to 26.1%;
 - Table 5 (medium-sized firms) the growth is from 10.7% to 19.5%; and
 - Table 6 (small firms) the growth in equity-based compensation as a proportion of total compensation between 2001 and 2012 is from 5.8% to 23.2%. These proportions are however somewhat misleading because the average equity based payment in 2001 to small firms is only \$19,226 per firm, and this rose to \$157,936 per firm by 2012. Among the top 100 firms equity-based compensation dwarfs these values with mean equity-based compensation rising from an average of \$234,287 in 2001 to \$1,139,360 by 2012.
- Yearly growth figures show that mean and median CEO compensation for all firms in Table 1 grew quite strongly over 2001–2007, but the GFC has stopped this trend, resulting in mean CEO compensation in 2012 at approximately the same level as in 2007. Median CEO pay has continued to show modest growth from 2007 to 2012. The levels of pay for the top 100 firms have, however, declined quite dramatically between 2007 (where the average total compensation for a CEO of a top 100 firm was \$5.890 million) and 2012 (where the average pay was \$3.744

million). On average a top 100 CEO in Australia is about \$2 million worse off in 2012 than he/she was in 2007. Among the top 200 firms the drop in average pay between 2007 and 2012 is \$1.378 million, for the top 300 firms it is \$0.985 million and for medium size firms the average CEO salary drops by \$0.404 million. Small firm CEO total compensation bucks this trend, rising from \$0.518 million in 2007 to \$0.680 million in 2012.

- Irrespective of the groupings we form, Australian CEO total compensation (both means and medians) have outstripped the CPI over the 12 years we summarize. These trends are clearly evident in each of the figures we provide. The increase is largely attributable to equity compensation in each group. For example, average equity compensation in top 100 firms rises by \$905,073 meaning that top 100 firms' total compensation outstrips inflation by almost one million dollars.

EMPIRICAL EVIDENCE ON EXECUTIVE COMPENSATION

There is an extensive literature on CEO compensation with a particular focus on US public firms (see, for example, review articles by Frydman and Jenter (2010), Murphy (1999, 2013), Jensen and Murphy (2004), Kaplan (2013), and Ferrarini *et al.* (2009)). We do not intend to fully canvass this voluminous work. Rather we attempt to draw out broad trends that emerge from review papers that involve time series and cross sectional examinations, and then provide a comprehensive review on the Australian-based evidence.

The Increase in CEO Compensation

The dramatic increase in CEO compensation of US publicly traded corporations over the past three decades has attracted extensive attention in academic research. Most studies rely on either the efficient-contracting theories or managerial-power theories in an attempt to explain the increase. However, as argued by Murphy (2013), any compelling theory must not only explain the increased level of CEO pay, but should also explain the explosion in option grants to lower-level executives and employees, the leveling of CEO pay after 2001 and the emerging dominance of restricted stock in the early 2000s.

In the efficient-contracting camp, several general equilibrium models are recently developed by accommodating the shift in the relative importance of general 'managerial capital' or the marginal product of managerial ability as a function of firm size. One important change in the CEO labour market over the past several decades is the increased prevalence of newly appointed CEOs being hired externally, jumping from 15% in the 1970s to nearly one-third in the late 1990s (Murphy and Zabojsnik, 2007). Murphy and Zabojsnik (2007) and Frydman (2007) therefore argue that the nature of the CEO job market has changed gradually over recent years and that the demand for CEOs has shifted away from firm-specific capital (reflecting skills, knowledge, and experience valuable only within the organization) towards more general managerial skills. Both papers offer general equilibrium models and attribute the increase in CEO wages to the increased prevalence of outside hiring and

the intensified competition among firms for managerial talent. The above argument is further supported by the comparable rise in pay for top talent in other sectors with active and mobile labour markets, such as athletes, lawyers, investment bankers, and hedge fund managers during the same period (Kaplan and Rauh, 2010).

On the other hand, Gabaix and Landier (2008) build an equilibrium model and argue that in equilibrium the most skilled CEOs should be employed by the largest companies, as managerial talent has greatest effect in larger firms. Accordingly, any shift in the size distribution of firms will lead to a proportional change in CEO pay. They show that the dramatic rise in US CEO pay since 1980 can be fully explained by the simultaneous growth in firm size.

However, as Murphy (2013) argues, while the efficient-contracting theories provide important insights on the rise in CEO pay, they cannot explain why stock options were once the preferred form of equity incentives, and why this shifted to restricted stock after 2001. More importantly, the extensive option grants to employees well below the executive suite are also contradictory to efficient-contracting theories.

Compared to the efficient-contracting camp, the managerial-power hypothesis is even less successful in explaining the increase in CEO pay. Under this hypothesis, CEOs in firms with weak corporate governance and acquiescent boards are able to (at least partly) determine their compensation, resulting in inefficiently high levels of compensation. This argument is inconsistent with improved board independence in US firms during the 1990s, as evidenced by the increasingly higher percentage of outside directors serving on the board and the CEO being the sole insider in about half of all firms (Murphy, 2013). In fact, it is well documented that most aspects of corporate governance in US firms have improved since the 1970s, which in turn largely weakens the influence of CEOs over board members (Hölmstrom and Kaplan, 2001).

In attempting to offer a managerial-power explanation, Bebchuk and Grinstein (2005) argue that the ‘outrage constraint’ on managerial power largely depends on stock market conditions and sentiment. The stock market boom in the 1990s weakened outrage and led to a dramatic increase in CEO pay over that decade. Conversely, outrage strengthened in the bearish market during 2000–2002, resulting in a reduction in CEO pay and the use of stock options. However, as Murphy (2013) argues, a fundamental problem with the managerial-power hypothesis, as well as the Bebchuk and Grinstein (2005) explanation, is that ‘there is no principled way to refute any trend in pay given the authors’ flexible (and unmeasurable) definition of both the “outrage constraint” and its importance’ (Murphy, 2013, p. 334).

Besides the efficient-contracting and managerial-power theories, recent research also offers several explanations, with some success, to understand the increase in CEO pay from other perspectives, such as perceived costs of options, disclosure requirements, tax policies, and non-market mechanisms. Hall and Murphy (2002) argue that the greater use of stock options in the 1990s reflects the fact that many directors and top executives perceived options to be costless and did not understand their true economic cost for shareholders. The SEC disclosure rules in place during that period and the pre-2003 NYSE listing requirement also contributed to the ‘perceived cost’ problem, as the costs of options to be granted were not required to be

disclosed or approved by shareholders. The perceived cost view may also explain the decreased use of options since 2002, as many firms voluntarily expensed options since early 2003 under FAS 123R, which was mandated in 2006 (Murphy, 2013). In addition, Rose and Wolfram (2002) claim that the tax laws enacted in 1994 effectively made stock options less expensive than cash pay and this partly contributed to the explosion in stock options.

Piketty and Saez (2003, 2006) propose an explanation based on non-market mechanisms, such as social norms or labour market institutions. They document evidence of a U-shape pattern over the course of the twentieth century for the pay of those at the very top of the income distribution. They therefore argue that the shift in social norms towards the acceptability of extreme pay since the 1970s contributed to the increase in CEO compensation.

Most empirical studies on CEO compensation limit their samples to the post-1990 period, when the Execucomp data are readily available for US firms. Frydman and Saks (2010), however, offer a unique long-term perspective by hand-collecting and examining CEO pay in the top 100 (in terms of sales) US firms over the period 1936 to 2005. In line with Piketty and Saez (2003, 2006), Frydman and Jenter (2010) show that CEO compensation between the end of World War II and before the mid-1970s is characterized by low levels of pay, little dispersion across top managers, moderate pay–performance sensitivities, and a weak relation between pay and firm size. From the mid-1970s to the early 2000s, compensation levels grew dramatically, differences in pay among CEOs widened, and equity incentives tied managers' wealth closer to firm performance and firm size. The long-term perspective presented in Frydman and Saks (2010) therefore reveals that the recent theoretical advances fail to explain the trend in CEO pay in the pre-1970 period.

CEO Incentives and Pay–Performance Sensitivity

Equity-based compensation is used to align the interests of shareholders and managers (Jensen and Meckling, 1976) because decisions that increase shareholders' wealth also increase managers' wealth. To measure CEO incentives, pay–performance sensitivity is often utilized, which indicates how much compensation depends on how well the company performs. Jensen and Murphy (1990) conceptualize pay–performance sensitivity as the dollar change in executive wealth associated with each dollar change in shareholder wealth. They document that for between 1974 and 1986 the average CEO experiences a change in wealth of \$3.25 for each \$1,000 change in firm value, and the pay–performance sensitivity decreases in firm size. The results therefore indicate that CEO incentives are low on average, particularly in large firms.

The insensitivity of CEO wealth to performance documented in Jensen and Murphy (1990) is questioned by subsequent research, and alternative measures of pay–performance sensitivity are proposed (see Hall and Liebman, 1998; Aggarwal and Samwick, 1999; Edmans and Gabaix, 2009). For example, Hall and Liebman (1998) argue that the dollar changes in CEO wealth due to typical changes in firm value are, in fact, not small. They measure CEO incentives as the dollar change in CEO wealth for a percentage change in firm value. Murphy (1985) and Kaplan

(1994) recommend the use of the elasticity of CEO wealth to shareholder value, which indicates the percentage change in CEO wealth for a percentage change in firm value. Edmans and Gabaix (2009) and Frydman and Jenter (2010) discuss the advantages and disadvantages of different incentive measures. They suggest that they are all important and should be considered independently due to the heterogeneity of corporate activities CEOs engage in and CEO utility.⁸

Overall, research on US firms suggests that the pay–performance sensitivity of CEOs’ wealth surged during the 1990s, mostly due to the use of executive options (Frydman and Jenter, 2010). Between 1990 and 2011, CEOs were rewarded for good performance, and penalized for poor performance (Kaplan, 2013). However, the fractional ownership of most US CEOs in the firms they manage remains low, and it is even lower today than it was in the 1930s (Frydman and Jenter, 2010).

CEO Pay, Firm Performance, and Corporate Actions

The issue of whether CEO incentives affect firm performance has been quite controversial and there is no theoretical and empirical consensus in the literature. In a seminal study, Morck *et al.* (1988) document a nonlinear, cross-sectional relation between managerial ownership and firm valuation. They find that firm performance increases in managerial ownership for ownership lower than 5% or greater than 25%, but decreases in ownership between 5% and 25%. While the results in Morck *et al.* (1988) imply that greater CEO incentives are not always better-aligned and tend to be worse in the 5% to 25% ownership range, subsequent studies present mixed evidence on the effect of different aspects of CEO equity incentives on firm performance (see McConnell and Servaes, 1990; Mehran, 1995; Habib and Ljungqvist, 2005).

In contrast, Demsetz and Lehn (1985) and Himmelberg *et al.* (1999) argue that observed levels of managerial ownership represent an equilibrium solution to agency problems. As the complex process of compensation arrangements involves the CEO, the compensation committee and consultants, the boards, and the external labour market of executives, the level of compensation and incentives is/are determined by a large number of observable and unobservable firm and CEO characteristics. Therefore, the cross-sectional relation between managerial ownership and firm value is spurious. To control for the alleged endogeneity problem, studies by Demsetz and Lehn (1985), Loderer and Martin (1997), Cho (1998), Himmelberg *et al.* (1999), Palia (2001), and Villalonga and Amit (2006) either utilize simultaneous equations models or employ instrumental variables so as to identify the causal effects of managerial incentives on firm value. In addition, Coles *et al.* (2012) estimate a structural model and show that the documented hump-shaped relation between managerial ownership and firm value (McConnell and Servaes, 1990) is the outcome of firms having different productivity from physical assets

⁸ For example, the Jensen Murphy statistic is the right measure for corporate actions where the dollar effect is not dependent on the size of the firm, such as overpaying for a takeover. The incentive measure suggested by Hall and Liebman (1998) is appropriate for activities where impact scales with firm size (e.g., a corporate restructure). The elasticity measure is the right one when the effort choice of the CEO has a multiplicative impact on both firm value and CEO utility.

and managerial inputs. To assess the effectiveness of standard econometric approaches to the well-known endogeneity problem, they conclude that fixed effects and instrumental variables do not generally provide reliable solutions to simultaneity bias in testing the effect of managerial ownership on firm performance.

Given the difficulty of convincingly identifying the causal effects of managerial incentives on firm value, recent research endeavours to connect executive incentives to a wide variety of corporate decisions and outcomes. The idea behind this is that incentives influence the decisions managers make, which in turn impact firm value. For example, Core and Larcker (2002) examine a sample of firms adopting ‘target ownership plans’ and find that the required increases in managerial ownership lead to improvements in the firm’s operating performance. Fenn and Liang (2001) and Brown *et al.* (2007) find that executives with higher ownership are more likely to increase dividends, but Fenn and Liang (2001) also show that management stock options are negatively (positively) related to dividends (repurchases). Denis *et al.* (1997) suggest that managerial ownership creates incentives for managers to pursue value-increasing investments and therefore constrains business diversification and avoids value destruction.

With respect to managerial risk taking, recent studies recognize the differential theoretical predictions regarding the relationship between firm risk and the sensitivity of executives’ wealth to firm risk (vega) and to changes in stock price (delta). Coles *et al.* (2006) and Low (2009) document a positive relationship between vega and firm risk, but provide mixed evidence for delta. Evidence on CEO pay and takeovers is also mixed. Consistent with efficient contracting, Datta *et al.* (2001) document a strong positive relation between acquiring managers’ equity-based compensation and merger performance. In contrast, Harford and Li (2007) compare compensation policies implemented in firms that undertake either acquisitions or capital expenditures (external vs. internal investment). Consistent with managerial-power explanations, Harford and Li (2007) find that CEOs are financially better off from making acquisition decisions, even though these decisions typically destroy shareholder value (see also Bliss and Rosen, 2001).

Overall, there is ample but often mixed evidence between CEO incentives and a variety of corporate policies and actions. While one may interpret this evidence as empirical validity of the widespread misuse of CEO compensation, an alternative is that the endogeneity of compensation arrangements makes it extremely difficult to interpret any observed relation between CEO compensation and corporate outcomes as evidence of a causal effect. A response to such a challenge in recent research is to identify a natural experiment, such as a regulatory change and unexpected ‘shock’ to the economy (see, for example, Brown *et al.*, 2007; Gormley *et al.*, 2013).

Australian Evidence

The level of CEO pay and its determinants Early research (before 1999) on Australian CEO compensation typically examines the association between the level of CEO cash-based compensation and firm size and performance. This is largely due to disclosure requirements in Australia before 1998, when information about

component parts of remuneration is absent and unavailable for research. In addition, early research tends to rely on a small sample of Australian firms and/or a relatively short sample period, which makes the hand-collection of CEO compensation data from annual reports feasible and cost-effective. The sample size in these studies is typically less than 100, with the only exception being Merhebi *et al.* (2006).⁹ Although early research on Australian CEO pay generally documents a positive association between the level of CEO cash-based compensation and firm size, it typically reports that cash-based compensation and its components are not significantly associated with prior-year or current-year firm performance measured by either accounting return (such as ROA or ROE) or stock return of the firm. Table 7 provides a summary of Australian empirical studies on the level of CEO compensation.

For example, Izan *et al.* (1998) examine the relation between cash-based compensation, accounting and share price performance, and firm size for a sample of 99 Australian firms with available financial and price data from 1987 to 1992. They find no evidence of a linkage between CEO cash pay and current period performance, as well as prior-year performance. They discuss several alternative explanations and conclude that Australian CEOs have had, at least compared to US CEOs, a relatively small proportion of total (cash) compensation ‘at risk’. O’Neill and Job (1999) examine 49 large Australian firms in 1997. They find that the level of CEO base salary and aggregate pay is positively related to firm size, but there is no significant relation between CEO pay and firm performance, CEO age, and the number of CEO service years.

Merhebi *et al.* (2006) conduct a large sample study on CEO cash pay for the Top 500 Australian public firms (based on reported profits) for the period 1990–1999.¹⁰ They find that: (a) CEO pay is statistically positively related to firm size (CEO pay increases by 2.74% for a 10% increase in firm size, measured as revenue); and (b) CEO pay is insignificantly related to contemporaneous measures of performance (return on assets, return on equity, and share price performance).

Two exceptions in early research are studies by Matolcsy (2000) and Holland *et al.* (2001), which report either mixed or weak evidence on the relationship between CEO cash pay and firm performance. Holland *et al.* (2001) examine a sample of 26 Australian companies over 1989–1999 and find a weak positive relationship between CEO compensation and current period market performance (no statistics are presented). Matolcsy (2000) tests how business cycles affect the association between changes in CEO pay and changes in firm performance. Using a sample of 100 randomly selected Australian firms over 1987–1995, Matolcsy first shows that, on average, CEO cash-based compensation increased by 13.24% over the sample period. The average growth rate is higher during periods of ‘Steady growth’ (15%) and ‘Soft landing’ (24%), and lower for periods of ‘Flat recovery’ (9%) and ‘Recession’ (11%). The results show that the relationship between changes in CEO cash compensation and changes in financial performance is positive during economic growth, but flat during an economic downturn.

⁹ This is partly because machine readable databases that include information about executive compensation have not been commercially available until recently.

¹⁰ The data disclosed at the time of the Merhebi *et al.* (2006) study do not provide details on equity based compensation.

TABLE 7
 AUSTRALIAN EMPIRICAL STUDIES ON THE LEVEL OF CEO COMPENSATION

Authors	Year	Sample/ Sources	Sample year	Pay measures	Size	Prior-year performance	Current-year performance	Other determinants	Key findings
Capezio, Shields, and O'Donnell	2011	663 (4,456) firms (firm-years) from ASX top 500, source unknown	1998– 2006	Total cash-based compensation and its components	+		Current stock return(X)	Incoming CEO(-), board independence (X)	Board structural independence does not affect the relation between CEO pay and performance The results contradict both efficient- contracting and managerial- power theories Fixed salary and share-based components of compensation are consistent with efficient- contracting explanations, while bonuses and option grants are found to be consistent with rent extraction The ratio of options over total pay is positively
Chalmers, Koh, and Stapledon	2006	133 (532) firms (firm-years) for ASX top 200, annual reports	1999– 2002	Total compensation, salary, bonus, shares, and options	+	Past ROA (+), past return(X)		Board size(+), CEO ownership (-), firm risk(+)	
Coulton and Taylor	2002	258 ASX firms, annual report	2000	Executive stock option	+	Prior stock return(+)	Current ROA(-)	CEO ownership (-), insider ownership(-)	

EXECUTIVE COMPENSATION CONTRACTS

TABLE 7
CONTINUED

Authors	Year	Sample/ Sources	Sample year	Pay measures	Size	Prior-year performance	Current-year performance	Other determinants	Key findings
Cybinski and Windsor	2013	143 ASX300 firms	2001	Total cash pay, and CEO bonus		Prior-year ROA(X)			associated with firm size and prior-year return, but negatively related to current-year ROA, CEO ownership and insider ownership. The results indicate that firms with weak corporate governance are likely to use stock options excessively. The relation between CEO cash pay and prior-year performance is only significant in the largest 50 firms among ASX300 with an independent remuneration committee

TABLE 7
CONTINUED

Authors	Year	Sample/ Sources	Sample year	Pay measures	Size	Prior-year performance	Current-year performance	Other determinants	Key findings
Doucouliagos, Haman, and Askary	2007	10 Australian banks, 149 firm- years, annual report	1992– 2005	Total compensation	+	Prior bank performance (+), prior- year stock return(+)		Institutional ownership(+), board size(-)	CEO pay is positively related to firm size, prior-year bank performance, prior-year stock return, and institutional ownership, but negatively associated with board size
Heaney, Tawani, and Goodwin	2010	1,144 listed Australian firms, annual report	2006	Total compensation	+	Prior ROA (X), prior stock return (X),	Current ROA (X), current stock return(X),	Board size(+), growth option(+), CEO duality(-)	The level of CEO compensation is found to be positively related to size, board size, growth options, and the separation of CEO and Chairman roles in the board However, there is no evidence of a significant relation between CEO pay and firm

TABLE 7
CONTINUED

Authors	Year	Sample/ Sources	Sample year	Pay measures	Size	Prior-year performance	Current-year performance	Other determinants	Key findings
Holland, Dowling, and Immes	2001	26 (312) Australian firms (firm-years)	1988– 1999	Total compensation	+		Current stock return(+ weak)		performance (either accounting or market performance) in the prior year or future year A weak positive relationship between CEO compensation and current period market performance, and a strong positive association between CEO pay and firm size, which has decreased over the sample period They find no evidence of a linkage between CEO cash pay and current period performance, as
Izan, Sidhu, and Taylor	1998	99 (488) Australian firms (firm-years) with available financial and price data, annual reports	1987– 1992	Total cash compensation	+	Prior ROE (X), prior stock return (X)	Current ROE (X),current stock return(X), (X)		

TABLE 7
CONTINUED

Authors	Year	Sample/ Sources	Sample year	Pay measures	Size	Prior-year performance	Current-year performance	Other determinants	Key findings
Lee	2009	66 Australian firms, 47 performance-improving and 19 declining, annual reports	2003	Performance-based pay, namely bonus and equity pay	+		Change in ROE (+)	CEO duality(+), CEO change(-), board independence (X)	well as prior-year performance Firm size is positively related to CEO pay Australian CEOs have had, at least compared to US CEOs, a relatively small proportion of total (cash) compensation 'at risk' CEO performance-based pay is positively linked to change in financial performance, firm size, and CEO duality, and is likely to reduce in case of a CEO change There is no evidence of an association between performance-

TABLE 7
CONTINUED

Authors	Year	Sample/ Sources	Sample year	Pay measures	Size	Prior-year performance	Current-year performance	Other determinants	Key findings
Matolcsy	2000	100 randomly selected Australian firms, 900 firm-years, annual reports	1987– 1995	Changes in total cash-based compensation			Changes in financial performance (mixed)		based pay and board independence The relationship between changes in CEO cash compensation and changes in financial performance is positive during economic growth, but is flat during an economic downturn Levels of Australian CEO compensation are associated with the firm's underlying eco- nomic character- istics, with a positive relation to firm size, firm complexity, and current stock price performance
Matolcsy and Wright	2006	696 firm-years from top 500 Australian firms, Sirca Limited	1999– 2001	Total compensation	+		Current stock return(+)	Firm complexity(+)	

TABLE 7
CONTINUED

Authors	Year	Sample/ Sources	Sample year	Pay measures	Size	Prior-year performance	Current-year performance	Other determinants	Key findings
Matlcsy and Wright	2007	696 firm-years from top 500 Australian firms, Sirca Limited	1999– 2001	Total compensation, cash, and equity- based pay	+				Finds 34% firm- years with only cash pay and 66% firm-years where a combination of cash- and equity- based compensation is paid CEO pay is highest in the banking and finance sector, but the pay levels are much lower than US CEOs CEO pay is positively related to firm size, but is not related to contemporaneous accounting and market performance
Merhebi, Pattenden, Swan and Zhou	2006	722 (2,574) firms (firm-years) from the Top 500 firms listed in <i>Business Review Weekly</i> , annual reports	1990– 1999	Total cash compensation	+		Current ROA (X), current stock return(X),		

TABLE 7
CONTINUED

Authors	Year	Sample/ Sources	Sample year	Pay measures	Size	Prior-year performance	Current-year performance	Other determinants	Key findings
O'Neill and Iob	1999	49 firms from top 150 Australian firms, annual reports	1997	Salary and total pay	+		Accounting performance(X)	CEO age(X), CEO service years(X)	The level of CEO base salary and total pay is positively related to size, but is not associated with firm performance, CEO age, and the number of CEO service years
Schultz, Tian, and Twite	2013	8,594 firm-years with available compensation data, Boardroom	2000– 2010	Total compensation, known pay, cash bonus, and long-term at- risk pay	+		Current ROA(+)	Tobin Q(+), leverage(-), Board size(+), CEO duality(-), the ratio of nonexecutive directors (+), the existence of remuneration committee(+), CEO serving the remuneration committee(-)	There is no evidence of a consistent relationship between the effectiveness of board monitoring activity and levels of CEO compensation Results also highlight the role of blockholders (outside and inside) in affecting the pay- performance sensitivity

TABLE 7
CONTINUED

Authors	Year	Sample/ Sources	Sample year	Pay measures	Size	Prior-year performance	Current-year performance	Other determinants	Key findings
Walker	2010	50 randomly selected 'high-growth' and 50 'low-growth' firms, annual reports	2005–2006	Performance-based pay and equity pay	+		Current ROA (X)	Growth(+), CEO ownership(X), CEO duality(X)	Performance-based pay is positively related to firm size and growth, but is not significantly associated with ROA, CEO ownership and CEO duality

Australian regulations and disclosure requirements in relation to executive and director pay were amended by the *Company Law Review Act 1998* (CLRA) as part of the Corporate Law Economic Reform Program (CLERP). The CLRA amended provisions of the *Corporations Law* deal with financial reporting and auditing for accounting periods ending on or after 1 July 1998. Since then, Australian public companies have been required, in their directors' report, to provide detailed information and discussion on the nature, amount, and rationale of each element of the compensation paid to senior executives and board directors, including equity-based compensation. The regulation was further amended in 2004, including the issuance of an accounting standard (AASB 1046 Director and Executive Disclosures by Disclosing Entities) prescribing detailed disclosure of executive and director remuneration components, and the *CLERP (Audit Reform and Corporate Disclosure) Act 2004* (CLERP9) introducing a number of amendments in relation to executive compensation.

Following the introduction of increased disclosure regulations that came into effect on 1 July 1998, Matolcsy and Wright (2007) provide descriptive evidence on the structure of Australian CEO pay for the period of 1999–2001. Using firms in the Top 500 with available data, they find 238 firm-years (34%) where only cash is paid to the CEO and 458 firm-years (66%) where a combination of cash- and equity-based compensation is paid. CEO compensation is highest in the cash and equity-based compensation group of the banking and finance sector where the mean (median) compensation for the equity-based group is \$1.865 million (\$1.153 million). These pay levels are much lower than in the US where Murphy (1999) reports median CEO compensation of \$US4.582 million for 1996.

Coulton and Taylor (2002) present the first Australian examination on executive stock options for a sample of 258 Australian firms in 2000. They find that large firms with better prior-year market performance are more likely to grant stock options to their CEOs. The percentage of stock options over total compensation is positively associated with firm size and prior-year stock return, but negatively related to current-year accounting performance (ROA), CEO ownership, and insider ownership. They conclude that the results are more consistent with the notion that firms with weak corporate governance are likely to use stock options excessively.

As information about equity-based compensation became more publicly available, recent research re-examines the association between firm performance and CEO pay, using total compensation as well as four different components (salary, bonus, shares, and options). Evidence suggests that the level of CEO compensation is positively related to current-year ROA (Schultz *et al.*, 2013), changes in ROE (Lee, 2009), and current-year stock return (Matolcsy and Wright, 2006), as well as past-year accounting performance (Chalmers *et al.*, 2006; Doucouliagos *et al.*, 2007). For example, Doucouliagos *et al.* (2007) explore the relationship between CEO pay and performance in 10 Australian banks during 1992–2005. They find that CEO pay is positively related to firm size, prior-year bank performance, prior-year stock return, and institutional ownership, but negatively associated with board size.

However, evidence on CEO pay and firm performance is somewhat inconclusive. A number of studies, particularly those examining CEO pay in one particular year or over a short sample period, report an insignificant association between CEO pay

and firm performance (Capezio *et al.*, 2011; Cybinski and Windsor, 2013; Heaney *et al.*, 2010; Walker, 2010). Walker (2010) randomly selected 50 ‘high-growth’ and 50 ‘low-growth’ Australian firms. She found that performance-based pay is positively related to firm size and growth, but not significantly associated with current-year ROA, CEO ownership and CEO duality. Heaney *et al.* (2010) analyze 1,144 listed Australian firms in 2006, following the adoption of International Financial Reporting Standards (IFRS) that resulted in more detailed disclosure on executive compensation. They find no evidence of any significant relation between CEO pay and firm performance (either accounting or market performance) in the prior, current, or future year.

Matolcsy *et al.* (2009) note that prior evidence on the association between market-based measures of performance and stock and option-based compensation reveals both positive and negative effects, and thus they seek to explain these contradictory empirical results. They suggest that stock-based compensation can be used as a reward for past performance (in which case the market will view the grant as an expense) and as an incentive for future performance (in contrast, the market will view the grant as an asset). If stock-based compensation is a reward for past performance, a negative relationship is expected; whereas a positive relationship is expected if these payments are made to provide incentives for future performance. They use 259 firm-year observations for 1999–2004 disclosures and divide these into ‘reward’ and ‘incentive’ groups using firm prior period return characteristics and the degree of ‘at-the-money’ of the granted options. An instrumental variables approach is used to control for the mechanical relationship between the value of a share and the value of an option. After controlling for endogeneity, the results show a statistically positive association for the ‘incentive’ group; however, the ‘reward’ group is statistically insignificant.

Besides firm size and performance, research studies also endeavour to identify a variety of firm characteristics, CEO characteristics, and corporate governance variables that explain the level of CEO compensation in Australia. The rationale behind this is that the determination of compensation arrangements is a jointly-determined process involving the CEO, the compensation committee and its consultants, the board of directors, and the external labour market.

For firm characteristics, the level of CEO compensation is found to be positively related to firm size, the idiosyncratic risk of the firm (Chalmers *et al.*, 2006), growth opportunities (Heaney *et al.*, 2010; Walker, 2010), Tobin’s Q (Schultz *et al.*, 2013), and business complexity (Matolcsy and Wright, 2006), and negatively related to financial leverage (Schultz *et al.*, 2013). For instance, Matolcsy and Wright (2006) examine the relation between CEO compensation and firm characteristics for a sample of about 250 Australian firms among the ‘Top 500’ during 1999–2001. Consistent with efficient-contracting theories, they find that levels of Australian CEO compensation are associated with the firm’s underlying economic characteristics, which explain around 41.5% of cross-sectional variation in the levels of CEO pay. The level of CEO compensation is found to be positively related to firm size, firm complexity (measured by the number of subsidiaries), and current stock price performance.

With respect to CEO characteristics and governance variables, the level of CEO compensation is found to be positively related to board size (Chalmers *et al.*, 2006; Heaney *et al.*, 2010; Schultz *et al.*, 2013) and institutional ownership (Doucouliagos

et al., 2007), and negatively related to a CEO change (Capezio *et al.*, 2011; Lee, 2009), CEO ownership (Coulton and Taylor, 2002; Chalmers *et al.*, 2006), and insider ownership (Coulton and Taylor, 2002). There is mixed evidence on the relation between CEO pay and CEO duality. Heaney *et al.* (2010) and Schultz *et al.* (2013) report a negative relationship, while Lee (2009) and Walker (2010) document a positive or insignificant association. O'Neill and Iob (1999) find no significant relation between CEO cash pay and CEO age and the number of CEO service year.

Importantly, prior research finds that the effectiveness of board monitoring is not significantly related to the level of CEO compensation (Lee, 2009; Capezio *et al.*, 2011; Schultz *et al.*, 2013). For example, Schultz *et al.* (2013) do not find a consistent relationship between the effectiveness of board monitoring activity and CEO compensation. The proportion of nonexecutive directors and the existence of a remuneration committee are both positively related to CEO pay, which is at odds with the notion that greater monitoring afforded by these characteristics would lower CEO pay. Inconsistent with the incentive effect, there is a negative impact of CEO duality and a CEO serving on the remuneration committee on CEO pay.

Capezio *et al.* (2011) use the top 500 ASX firms for the period 1998–2006 and examine whether board structural independence is an important boundary condition for the enforcement of CEO pay-for-performance. Employing a system Generalized Method of Moments (GMM), they find that the pay–performance relation is not significantly different in firms in which the boards are chaired by non-executives and dominated by non-executive directors (at both the full board and compensation committee levels). They also find that the level of CEO cash compensation is influenced by firm size, but not firm performance. They therefore conclude that the results contradict both efficient-contracting and managerial-power theories, and argue that policy makers' faith in incentive plans and the moderating influence of structural independence *per se* may be misplaced.

On the other hand, Chalmers *et al.* (2006) use the enhanced executive remuneration disclosure regulations introduced in Australia on 1 July 1998 to examine firm attributes that are associated with, and explain differences in, CEO pay levels, and whether CEO compensation and performance relationships are consistent with labour demand theory (efficient contracting) or rent extraction (managerial power). Total compensation is found to be significantly positively related to size, ROA, the idiosyncratic risk of the firm, and board size, while a significant negative relationship is found for CEO ownership. When considering different components of CEO pay, they find the fixed salary and share-based components of compensation are consistent with efficient-contracting explanations, while bonuses and option grants are found to be consistent with rent extraction (particularly for smaller firms and for firms with above average performance). The rent extraction is statistically significant, though it is economically negligible and short-lived, in contrast to US evidence where, according to Core *et al.* (1999), rent extraction is wide-spread, persistent, and economically substantial.

The trend of Australian CEO pay In its report on executive remuneration, the Productivity Commission (2009, p. 41) notes that from 1993 to 2009, average

compensation of ASX100 CEOs increased in real terms at an average rate of 6–7%, equivalent to an increase from 17 times average earnings in Australia in 1993 to 42 times in 2009. The rate of increase is significantly stronger in the 1990s (12%), with slower but still positive growth from 2000–2007.

Pottenger and Leigh (2015) present a long-term perspective of executive compensation for BHP, the resources giant and one of the largest companies in Australia, over the period 1887–2013. Similar to the pattern in US CEO compensation and Australian top incomes, they find the trend in director remuneration (relative to average earnings) follows a U-shape. Specifically, the pay to executives and directors of BHP increased from the 1880s to the 1910s, trended downwards through the 1920s and into the 1930s, rose briefly during World War II and fell again from the 1940s until the 1980s. However, director pay subsequently has increased dramatically, consistent with the trend in executive compensation in the largest Australian firms. They therefore suggest that Australia experienced a ‘great compression’ in executive salaries during the post-war era, followed by the recent ‘great divergence’ in the late 20th century. The documented pattern is similar to the long-term analysis of US CEO pay and the US evidence on managerial labour market in Frydman and Saks (2010) and Piketty and Saez (2003).

Matolcsy *et al.* (2012) consider a unique setting where Australian companies have changed from cash bonus to equity-based compensation, and examine determinants and performance consequences of changes in CEO compensation structure. According to efficient-contracting theory, they argue that the change to equity-based compensation is driven by changes in firm characteristics and by CEO turnover, the latter providing a less costly opportunity for such change. Using a sample of 2,288 firm-years over 2001–2009, they find larger firms with more business segments and higher investment opportunities are more likely to change their compensation structure. The likelihood is also higher when there is a change of CEO. They also document a significant negative association between changes in compensation structure and the firm’s financial and stock price performance in the following year, even after controlling for CEO turnover and poor governance environment. They suggest that the initial change to equity-based compensation is part of an error learning process made by firms that leads them towards efficient CEO compensation contracts.

Hill *et al.* (2011) present an insightful comparison in CEO employment contracts between Australia and the US. They create pairs of US and Australian firms matched on firm size, industry, and contract starting date. They find that Australian CEOs have significantly greater base salaries than their US counterparts, but are less likely to be compensated with restricted stock and stock options. Interestingly, the employment contracts for Australian CEOs tend to be shorter than US contracts and have more restrictions on CEO actions. In contrast, employment contracts for US CEOs are more likely to have arbitration provisions, change-in-control provisions, tax gross ups, do not compete clauses, and supplementary executive retirement plans (SERPs). Hill *et al.* (2011) suggest that some of the differences reflect underlying differences in the legal, regulatory, and cultural environment. For example, the relative infrequency of change-in-control provisions in Australian contracts may be due to the more stringent ASX listing requirements, while vast differences in arbitration provisions may reflect cultural differences. However, a better understanding of institutional differences, such

as tax codes, takeover protection, and corporate governance practice is still needed to help explain remaining differences in CEO contracts between Australia and the US.

CEO pay–performance sensitivity Early research on CEO pay–performance sensitivity in Australia presents mixed evidence, partly due to the fact that these studies use total cash-based compensation and do not include equity-based pay (because disclosure was not required during these sample periods). Izan *et al.* (1998) present preliminary evidence on an insignificant and close to zero pay–performance sensitivity for total cash compensation over 1987–1992. Merhebi *et al.* (2006) study the Top 500 firms over 1990–1999, and report evidence consistent with efficient-contracting explanations. They find that: (a) changes in CEO cash pay is positively associated with the change in current and lagged period shareholder wealth (a CEO receives a 1.16% increase in pay for a 10% increase in shareholder wealth); and (b) CEO pay sensitivity decreases as the riskiness of the firm increases. Table 8 provides a summary of Australian evidence on the CEO pay–performance sensitivity.

Recent studies include both cash-based and equity-based compensation, and generally document statistically significant pay–performance sensitivity, albeit the magnitude is economically small. Clarkson *et al.* (2011) investigate the effect of increased shareholder oversight and disclosures about executive remuneration on the pay–performance sensitivity by controlling for contemporaneous changes in corporate governance practice. Using a sample of 240 firms with annual reports available for each year over 2001–2009, they find a general improvement in pay–performance sensitivity over the study period. The sensitivity increase is primarily related to enhanced remuneration disclosure and the non-binding shareholder vote on the remuneration report. They therefore conclude that enhanced oversight of executive remuneration arrangements resulting from regulatory change has a positive impact on executive compensation arrangements.

Schultz *et al.* (2013) examine the role of corporate governance mechanisms, namely blockholdings and board structure, in shaping pay–performance sensitivity using a large sample of Australian firms over 2000–2009. They find monitoring by outside blockholders increases the sensitivity of long-term at-risk pay-to-performance, thereby better aligning manager and shareholder interests. However, insider blockholders increase (decrease) the sensitivity of cash bonuses (long-term at-risk pay) to performance, indicative of differences in the horizons of managers and outsiders. They also find that larger boards are associated with lower sensitivity of at-risk pay, consistent with them affording less effective monitoring.

Monem and Ng (2013) consider a unique setting where the ‘two-strikes’ rule (i.e., the ‘say-on-pay’ legislation) was first introduced in Australia in 2011, and investigate the consequences of the regulatory change for pay–performance sensitivity. Using a sample of 104 firms in 2011 and 105 firms in 2012 that experienced the ‘first strike’, they find no difference in pay–performance sensitivity between the ‘first strike’ firms and the control firms. Shareholder voting power (measured by the ratio of ‘no’ votes to the total number of votes) has little impact on the pay–performance link. They conclude that the shareholders of the ‘first-strike’ firms may have been over-enthusiastic about their voting power in 2011 but exercised this power more judiciously in 2012, as the pay–performance relations improved slightly in 2012.

TABLE 8
AUSTRALIAN EMPIRICAL STUDIES ON THE CEO PAY–PERFORMANCE SENSITIVITY

Authors	Year	Sample/Sources	Sample year	Pay measures	Pay–performance sensitivity	Key findings
Clarkson, Walker, and Nicholls	2011	240 (2,160 firms (firm-years) available in each year of 2001–2009, annual report	2001–2009	Total compensation, salary, bonus, and equity pay	A general improvement in pay–performance sensitivity over 2001–2009. The sensitivity increase is primarily related to enhanced remuneration disclosure and the non-binding shareholder vote on the remuneration report	Enhanced oversight over executive remuneration arrangements resulting from regulatory change has a positive impact on the process of executive compensation arrangement by strengthening pay–performance sensitivity. Australian CEOs have had, at least compared to US CEOs, a relatively small proportion of total (cash) compensation ‘at risk’.
Izan, Sidhu, and Taylor	1998	99 (488) Australian firms (firm-years) with available financial and price data, annual reports	1987–1992	Total cash compensation	Preliminary evidence on pay–performance sensitivity for total cash compensation shows that the sensitivity is close to zero	Pay–performance sensitivity and elasticity are positive and significant. CEO pay sensitivity decreases as the riskiness of the firm increases. The results are consistent with an efficient-contracting explanation.
Merhebi, Pattenden, Swan, and Zhou	2006	722 (2,574) firms (firm-years) from ASX Top 500 firms listed in <i>Business Review Weekly</i> , annual reports	1990–1999	Total cash compensation	Changes in CEO cash pay is positively associated with the change in current and lagged period shareholder wealth (a CEO receives a 1.16% increase in pay for a 10% increase in shareholder wealth)	The pay–performance sensitivity is not significant for firms that experience a ‘first strike’ in 2011 under the ‘two-strikes’ rule. However, the relations improved in 2012. The results suggest that the shareholders of the ‘first-strike’ firms may have been over-enthusiastic about their voting power in 2011 but exercised this power more judiciously in 2012.
Monem and Ng	2013	104 firms in 2011 and 105 firms in 2012 that experience ‘first strike’, Boardroom	2011–2012	Total compensation	There is no difference in pay–performance sensitivity between the ‘first strike’ firms and the control firms. The shareholder voting power has little impact on the pay–performance sensitivity	

TABLE 8

CONTINUED

Authors	Year	Sample/Sources	Sample year	Pay measures	Pay-performance sensitivity	Key findings
Schultz, Tian, and Twite	2013	8,594 firm-years with available compensation data, Boardroom	2000–2010	Total compensation, known pay, cash bonus, and long-term at-risk pay	The sensitivity of long-term at-risk pay increases with monitoring blockholders, but decreases with insider blockholders and board size The sensitivity of cash bonuses increases with insider blockholders, and the sensitivity of known pay decreases with board size	Results highlight the role of blockholders (outsider and insider) in affecting the pay-performance sensitivity Monitoring blockholders better aligns manager and shareholder interests, while insider blockholders have a shorter investment horizon and prefer short-term pay Larger boards are found to be less effective monitors

It is important to note that most Australian studies do not consider changes in the value of the CEO's stock and option portfolio as a significant component of total compensation (Jensen and Murphy, 1990; Core *et al.*, 2003), partly due to the unavailability of CEO ownership data. Some studies argue that the rationale for excluding such changes in the CEO's wealth in assessing the pay–performance sensitivity is that rational shareholders are more likely to focus on compensation granted in the current year than on wealth accumulated through past equity and option grants, at least in the scenario they examine (for example, ‘say on pay’ as in Monem and Ng (2013)). However, a comprehensive measure of CEO incentives (pay–performance sensitivity) should take all possible links between firm performance and CEO wealth into account. The exclusion of the value of the CEO's stock and option portfolio, therefore, is likely to systematically underestimate the level of incentives (Jensen and Murphy, 1990; Frydman and Jenter, 2010).

CEO pay, firm performance, and corporate actions There is very limited Australian empirical evidence on the effect of CEO compensation on firm performance and corporate actions. To our knowledge, there are only three studies that present preliminary evidence in the area of firm performance (Matolcsy and Wright, 2011), merger and acquisitions (Bugeja *et al.*, 2012) and corporate investment (Li *et al.*, 2011). Table 9 provides a summary of Australian studies on the effect of CEO pay on firm performance and corporate actions.

Matolcsy and Wright (2011) use 3,053 firm-years drawn from 1999–2005 disclosures made by the Top 500 ASX firms to investigate efficient and inefficient CEO compensation structures, and their effects on firm performance. Approximately 30% of these firm-years have cash only compensation systems, while the remaining firms use both cash and equity-based compensations. They predict that firms that adopt CEO compensation structures that deviate from the ‘efficient compensation structure’ have lower performance than firms that have an efficient structure. Given the fact that a significant portion of firms adopt cash only compensation, they first use a logit model to ‘predict which compensation group a firm could belong to’ (p. 755).¹¹ The performance of firms in and not in the predicted group is then investigated,¹² with those not in the ‘optimal’ group predicted to have worse performance. The results confirm this prediction for all four performance measures.¹³

¹¹ In particular, Matolcsy and Wright (2011) estimate a cross sectional logit model using data for all firm years where the dependent variable equals one for the equity based group and two for the cash group. The independent variables include proxies for size, the market to book ratio, firm performance, earnings volatility, leverage, and CEO and blockholder ownership. They also estimate this logit model each year and find results that are generally the same as the main results with respect to signs of the ‘wrong group’ dummy, though not all cases are statistically significant.

¹² Approximately 95% of the equity group and 25% of the cash group are correctly predicted.

¹³ Performance is measured using both accounting based measures (return on assets and return on equity) and market based measures (fully diluted change in the stock price and fully diluted change in the stock price adjusted for CAPM beta risk).

TABLE 9
 AUSTRALIAN EMPIRICAL STUDIES ON THE EFFECT OF CEO PAY ON FIRM PERFORMANCE AND CORPORATE ACTIONS

Authors	Year	Sample/ Sources	Sample year	Incentive measures	Corporate outcome	Incentive effect and findings
Bugeja, da Silva Rosa, Duong, and Izan	2012	Acquiring and target firms in 177 M&A deals, Boardroom, and annual reports	2000–2007	Total compensation, salary, bonus, shares, and options	Takeovers	All components of CEO compensation increase in the M&A completion year and the subsequent year, but target CEOs receive lower compensation if they are on the nominating committee, or have higher ownership, or the board has a higher proportion of insiders. Results are more consistent with efficient contracting.
Li, Henry, and Chou	2011	1,471 firm- years with available data, Boardroom	2004–2007	Total equity-based pay to all executives and directors relative to total compensation or market value of equity	Investment level	There is a significant positive relation between corporate investment level and equity-based compensation relative to market value of equity, but the relation is not significant when equity-based compensation is measured as a ratio of total compensation. The results suggest that managers make investment decisions that concern their equity-based compensation.
Matolcsy and Wright	2011	3,503 firm- years for top 500 Australian firms, Sirca Limited	1999–2005	Cash-based or equity-based compensation group	Financial and stock price performance	Firms that adopt CEO compensation structures that deviate from the 'efficient compensation structure' (i.e., the incorrect group membership in either cash or equity compensation) have lower accounting and market performance than firms that have an efficient structure.

Bugeja *et al.* (2012) investigate CEO compensation in mergers and acquisitions and conclude that overall their findings are more consistent with the predictions of incentive alignment effects of efficient contracting than managerial-power theory, albeit that these theories are not mutually exclusive and that some evidence is consistent with managerial power. They use a sample of 177 takeover deals and 4,002 control firms drawn from 2000 to 2007 and show that CEO compensation increases significantly in the acquisition completion year and the subsequent year. All components of CEO compensation (salary only, bonus only, salary and bonus, shares, options, and total compensation) are found to increase. CEOs with longer tenure and those with larger boards of directors are paid more, as too are CEOs of firms involved in deals that have a more negative announcement effect (consistent with managerial power). However, other measures of managerial power (CEO on the nominating committee, higher CEO ownership, and the proportion of insiders on the board) are significantly negatively related to CEO compensation, consistent with efficient contracting. The study also shows that CEO compensation in acquiring firms is positively related to measures of performance (return on assets and stock market performance). Finally CEOs are paid more for larger takeovers if they acquire targets in different industries and if they revise (upwards) the original offer price to the target.

Li *et al.* (2011) provide some preliminary evidence on the relation between stock market mispricing, executive compensation, and corporate investment for the period 2004–2007. They document a significant positive relation between corporate investment levels and equity-based compensation (scaled by the market value of equity) for all executives and directors. However, the relation is not significant when total compensation (scaled by market value of equity) is used. Li *et al.* (2011) argue that equity-based compensation relative to market value of equity has a more direct link with shareholders' wealth, and that managers make investment decisions that positively affect their equity-based compensation.

DESIGN PRINCIPLES

Murphy (2013) concludes (in part) his comprehensive analysis of the evolution of US CEO remuneration with the following statement: 'Indeed, what makes CEO pay both interesting and complicated is the fact that the efficient contracting, managerial power, and political paradigms co-exist and interact' (Murphy, 2013, p. 346). Similarly Ferrarini *et al.*'s (2009) survey of European regulation on CEO remuneration highlights that: 'Establishing rules or guidelines on optimal pay, which also respond to public concerns with respect to fairness, is not an easy task' (Ferrarini *et al.*, 2009, p. 5). Nonetheless, we 'put our heads on the chopping block' by outlining a set of design principles for executive compensation contracts. Our motive is to generate debate, discussion, and hopefully consensus.

Cronqvist and Fahlenbrach (2013) investigate the way CEO compensation contracts change when public firms are acquired in a leveraged buyout (LBO) by private equity firms, which the authors regard as among the most financially sophisticated principals in US capital markets. A (small and non-random) sample of 20

large LBOs made between 2005 and 2007 by the largest US private equity firms is used. They find several contract features, but not all, are redesigned as follows.

- CEO base salary and bonuses increase by around 25%, particularly when new executives are hired to work in these highly levered organizations.
- A more performance-sensitive contract is negotiated where CEO effort is important. Contracts are redesigned so as to avoid qualitative, nonfinancial, and earnings-based measures. Cash-flow based measures, such as earnings before interest, taxes, depreciation, and amortization (EBITDA) that allow less accounting discretion than earnings, are adopted for short-term measures of performance. Longer term performance is measured using internal rates of return (IRR) or multiples of estimated firm value to acquisition price. A common contract provision is that about 50% of equity grants will performance-vest if IRR and multiple hurdles are met at exit.
- CEO severance pay multipliers remain unchanged.
- Unvested options and restricted stock grants are typically forfeited if a CEO is dismissed.
- The sale of vested shares on behalf of dismissed executives is restricted, typically through a right of first refusal and limits on the set of parties that can acquire vested stock. Dismissed CEOs find it practically impossible to unwind their vested equity positions.
- Perquisites, such as personal usage of firm assets and tax gross-ups, remain unchanged after the PE transaction.

Murphy and Jensen (2011) argue that their research and consulting experience leads to a conclusion that almost all CEO and executive bonus plans are deeply flawed, resulting in counterproductive incentives and decisions that harm shareholders. Their paper first describes a typical bonus plan and then moves to a discussion of using the wrong pay–performance relationships, the wrong standards or targets, the wrong performance measures, *ex post* adjustment to bonuses (including clawbacks), and the role of banking bonuses in the GFC. The paper contains a series of 10 recommendations for bonus plan design.

A typical bonus plan, drawn from Murphy and Jensen (2011, Figure 1, p. 4) is depicted in Figure D.

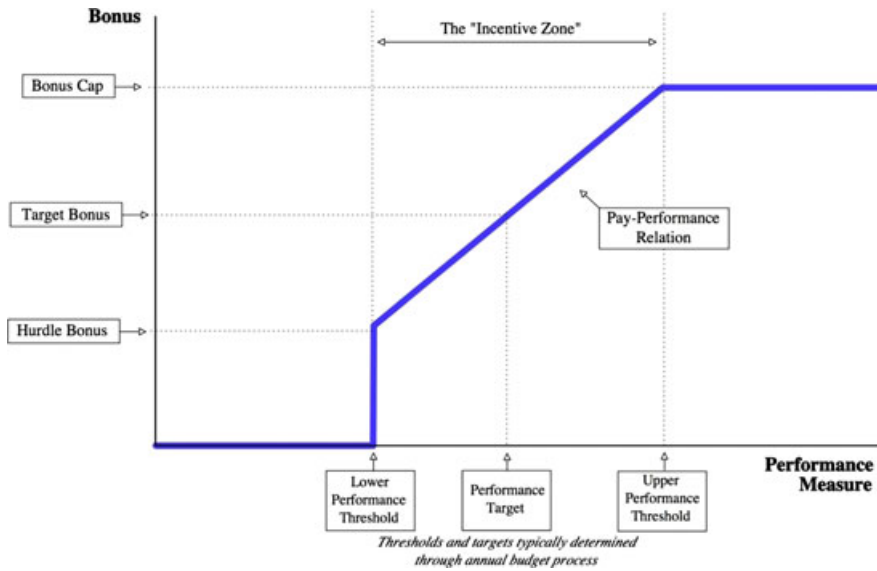
Murphy and Jensen (2011) argue that Figure D ‘is replete with incentive problems that destroy value’. Suppose a CEO has an upper hurdle for ROE of 15%, but is confident that the firm can easily surpass that threshold. A CEO they interviewed stated:

I’d have to be the stupidest CEO in the world to report an ROE of 18%. First, I wouldn’t get any bonus for any results above the cap. Second, I could have saved some of our earnings for next year. And third, [the board of directors] would increase my target performance for next year.

A bonus plan like this also motivates earnings management, sometimes taking a ‘big bath’ and it encourages low-balling in setting performance targets. They are also short-term in their focus. And, importantly, the pay–performance relationship in Figure D is non-linear.

Accordingly, Murphy and Jensen recommend (R1) that non-linear pay–performance be replaced by linear plans. The typical bonus plan in Figure D also

FIGURE D
A TYPICAL BONUS PLAN



Notes: Typical bonus plan, often referred to by compensation consultants as an ‘80/120 plan’. A performance target and a target bonus for meeting that performance are set. Upper and lower performance thresholds are established that create an ‘incentive zone’ within which the bonus increases with performance. Bonuses do not vary with performance outside the range established by the Lower and Upper Performance thresholds. A Hurdle Bonus is often paid when the executive reaches the lower performance threshold. The bonus can increase linearly with performance in the incentive zone (as shown here) or it can increase at a decreasing rate or an increasing rate (that is, the line can be convex or concave).

encourages people to lie. Accordingly Murphy and Jensen (2011, p. 19) recommend (R2), separating the budgeting process from the targets set in compensation formulas. It is clear that allowing managers to select their peer group for performance evaluation potentially involves perverse incentives, accordingly R3 states that executives should not be responsible for selecting the comparison group. It is also clear that a benchmark set this year that incorporates prior-year performance will ensure that executives who perform well in one year will be penalized the next. Accordingly R4 states that current year incentives should not be tied to prior performance while R5 states that incentive payments should not be tied to benchmarks that the CEO can influence.

It has long been recognized that ratios can be affected by altering the numerator or the denominator. Typically bonus plans want to encourage the numerator to be increased (because the numerator typically uses measures such as revenue, earnings, EBIDTA); however, the value of a ratio with a positive numerator and denominator can be increased by managing the denominator toward zero. Typically managing the value of the denominator downward (assets, sales, or equity) is value

destroying. Murphy and Jensen (2011) somewhat controversially recommend, given the prevalence of measures such as ROA or ROE,¹⁴ in R6 that ratios should not be used as performance measures.

CEOs can and do influence capital structure and a firm's cost of capital. The distinction between accounting profit and economic profit (defined as Economic profit = Accounting profit – Cost of capital × Amount of capital) is that economic profit incorporates the opportunity cost of capital employed in the firm. R7 recommends that performance measures should incorporate the cost of equity capital. It is virtually impossible to make foolproof objective and accurate measures of the contribution of an individual to firm value. Accordingly Murphy and Jensen (2011, p. 39) suggest that compensation committees should have the power to make after-the-fact *ex post* adjustments to both the measure of CEO performance and the compensation actually paid to the CEO. Accordingly they make a series of recommendations (R8 to R10) to address these concerns, as follows:

- R8 recommends that incentive plans should include a subjective component;
- R9 requires that CEOs should be held accountable for factors that are beyond their control if they can control or affect the impact of those uncontrollable factors on performance; and
- R10 recommends that incentive programs should provide for clawback of rewards, especially when data were manipulated or fraudulent. Bonus banks or deferred compensation are recommended.

While we agree with many of the recommendations made by Murphy and Jensen (2011) we came up, quite independently, with a different set of principles. Murphy and Jensen's recommendations focus on bonus plans, while ours are somewhat broader in scope. In developing these principles we were encouraged by colleagues to set out our views in the spirit of having a blank sheet of paper, though recognizing that the separation of ownership and control, and the attendant agency and incentive problems that result, need to be incorporated into CEO compensation contracts. Here is our list.¹⁵

1. Executive compensation should consist of two broad elements, a base pay and a flexible bonus element.
2. The base pay should be set taking into account the market for managerial talent. It can be adjusted to reflect changes in the market for managerial talent.
3. The bonus element should be based on performance of the firm, and its payment should vest over several years depending on performance outcomes over those years.
4. The bonus amount or bonus pool should be based on a share of the risk-adjusted wealth increase that shareholders have achieved in the contemporaneous period.

¹⁴ Murphy and Jensen (2011, pp. 35–37) show that ratio measures can quite easily be converted to 'valid' performance hurdles providing the compensation committee decides on an appropriate proportion of the dollar amount of the numerator of a ratio as going into a bonus pool.

¹⁵ As a result of the various commentaries we received on these principles we have modified some of these nine principles and added a tenth principle. These are restated in full in our 'Responses and Rejoinders to Commentaries'.

5. Bonus payments can be divided into equity-linked, cash, and perquisite components. It should be recognized that a CEO values equity-linked compensation at less than the cost of those awards to shareholders.

6. Equity-based compensation grants should be adjusted for dividend payments. The exercise price of executive options should be adjusted downward, while restricted stock should have dividend entitlements with the entitlement being adjusted upward by assuming the dividend is re-invested to acquire additional stock.

7. Performance measurement is subject to measurement error and, accordingly, performance should be classified as: (a) statistically superior to the benchmark; (b) statistically indistinguishable from the benchmark; and (c) statistically below the benchmark. Performance that is statistically below the benchmark should result in no bonus reward for the current period. The performance bonus should be higher for statistically superior performance than it is for performance that is statistically indistinguishable from the benchmark.

8. Firm performance should be measured relative to an appropriate independently selected set of peers taking risk into account. Bonus awards should be based on a measure of abnormal performance calculated as the firm's actual performance less the performance that is expected, given the actual performance of the benchmark peers. Firms with listed securities should use sharemarket returns in assessing abnormal performance, if the securities are efficiently priced.¹⁶ Audited accounting-based measures of performance can also be used providing they are prepared on a consistent basis. Audited cash-flow measures of performance should be used as a check on the reasonableness of earnings measures. Accounting measures of performance should be adjusted for the cost of capital.

9. Termination payments should be a function of the benchmark adjusted performance of the firm during the tenure of the executive. Three broad categories of performance (as in 7 above) should be developed. Entitlements to incentive payments that have been earned but that have not yet vested should vest on a CEO's resignation; however they should be subject to some clawback. A CEO who is dismissed for poor performance or inappropriate or illegal conduct should receive no termination bonus.

We illustrate the application of the measurement of the performance element for six prominent ASX listed companies (not randomly selected) in Table 10. The six companies, and their CEOs and appointment terms are as follows.

¹⁶ In *Cammer v. Bloom*, (1989), 711 *F.Supp.* 1264, 1276 (D.N.J.), United States District Court for the District of New Jersey, Judge Alfred J. Lechner outlined five factors that have become known as the 'Cammer factors' that that would help establish whether a security traded in an efficient market. Since then, dozens of courts have relied on the five 'Cammer factors' in evaluating market efficiency. The factors are: '(1) the stock's average weekly trading volume; (2) the number of securities analysts that followed and reported on the stock; (3) the presence of market makers and arbitrageurs; (4) the company's eligibility to file a Form S 3 Registration Statement; and (5) a cause and effect relationship, over time, between unexpected corporate events or financial releases and an immediate response in stock price'. Since then Courts have supplemented the five Cammer factors with other measures such as market capitalization, bid/ask spread, float, and analyses of autocorrelation (see Buckberg, 2012).

EXECUTIVE COMPENSATION CONTRACTS

TABLE 10

SHAREMARKET ESTIMATES OF SHAREHOLDER WEALTH CREATION OF FOUR ASX LISTED COMPANIES DURING THE TENURE OF THEIR FORMER CEO ESTIMATED USING: (a) THE CAPM; (b) THE MARKET MODEL; (c) FAMA FRENCH THREE FACTOR MODEL; AND (d) THE CARHART FOUR FACTOR MODEL

Panel A: Without including dividend imputation franking credits

Company and CEO	Telstra Corporation Trujillo, Solomon	Air New Zealand Zealand Fyfe, Robert	Caltex Australia Reeves, David	QGC Pty Limited Cottee, Richard	Mirvac Group Paramor, Gregory	Clough Limited Singleton, David
CAPM						
Alpha	0.49%	0.49%	4.44%	5.29%	1.37%	2.72%
<i>t</i> statistic ($\alpha = 0$)	0.63	0.50	2.26**	2.69***	1.17	1.79**
Market Model						
Alpha	0.16%	0.52%	4.50%	5.48%	1.38%	2.79%
<i>t</i> statistic ($\alpha = 0$)	0.21	0.53	2.07**	2.73***	1.15	1.67*
Fama French Three factor model						
Alpha	0.65%	0.18%	5.22%	5.46%	1.35%	2.65%
<i>t</i> statistic ($\alpha = 0$)	0.82	0.19	2.38**	2.85***	1.19	1.58*
Carhart Four factor model						
Alpha	0.60%	0.18%	5.31%	5.00%	1.62%	2.65%
<i>t</i> statistic ($\alpha = 0$)	0.75	0.19	2.36**	2.41**	1.27	1.53*

Panel B: Including dividend imputation franking credits

Company and CEO	Telstra Corporation Trujillo, Solomon	Air New Zealand Zealand Fyfe, Robert	Caltex Australia Reeves, David	QGC Pty Limited Cottee, Richard	Mirvac Group Paramor, Gregory	Clough Limited Singleton, David
CAPM						
Alpha	0.24%	0.39%	4.48%	5.23%	1.41%	2.85%
<i>t</i> statistic ($\alpha = 0$)	0.32	0.40	2.22**	2.65***	1.19	1.84**
Market Model						
Alpha	0.08%	0.43%	4.53%	5.43%	1.42%	2.92%
<i>t</i> statistic ($\alpha = 0$)	0.10	0.43	2.04**	2.69***	1.17	1.72*
Fama French Three factor model						
Alpha	0.36%	0.09%	5.27%	5.44%	1.41%	2.77%
<i>t</i> statistic ($\alpha = 0$)	0.47	0.09	2.35**	2.83***	1.24	1.62*
Carhart Four factor model						
Alpha	0.31%	0.09%	5.35%	4.99%	1.69%	2.78%
<i>t</i> statistic ($\alpha = 0$)	0.39	0.10	2.32**	2.40**	1.32	1.58*

* significant at 10%; ** significant at 5%; *** significant at 1%.

1. Telstra Corporation Limited (ASX code TLS). We evaluate the performance of TLS during the term of Solomon Trujillo, who was the CEO from July 2005 to May 2009.
2. Air New Zealand (ASX code AIZ). Robert Fyfe was appointed CEO in October 2005, and left his position in December 2012.
3. Caltex Australia Limited (ASX code CTX). David Reeves was the CEO from August 2003 to May 2006.

TABLE 11

SUMMARY STATISTICS OF THE ALPHA ESTIMATED FROM DIFFERENT MODELS OVER THE PERIOD OF TIME DURING WHICH THE CEOS WERE IN THAT POSITION

Panel A: All CEOs

	CAPM	Market model	Fama French three factor model	Carhart four factor model
N	589	589	589	589
Mean	0.0003	0.0010	0.0036	0.0026
Median	0.0009	0.0004	0.0015	0.0014
Standard deviation	0.0362	0.0360	0.0413	0.0433
Q1	0.0170	0.0179	0.0216	0.0222
Q3	0.0147	0.0145	0.0132	0.0128
obs(Positive)	310	301	272	276
% Positive	52.6%	51.1%	46.2%	46.9%
obs(Negative)	279	288	317	313
% Negative	47.4%	48.9%	53.8%	53.1%
obs(sig positive)	72	68	54	53
% Sig positive	12.2%	11.5%	9.2%	9.0%
obs(sig negative)	56	58	72	66
% Sig negative	9.5%	9.8%	12.2%	11.2%

Panel B: All CEOs (including dividend imputation franking credits)

	CAPM	Market model	Fama French three factor model	Carhart four factor model
N	589	589	589	589
Mean	0.0004	0.0017	0.0042	0.0031
Median	0.0006	0.0005	0.0017	0.0020
Standard deviation	0.0362	0.0360	0.0413	0.0433
Q1	0.0174	0.0191	0.0229	0.0232
Q3	0.0143	0.0146	0.0132	0.0136
obs(Positive)	301	299	270	274
% Positive	51.1%	50.8%	45.8%	46.5%
obs(Negative)	288	290	319	315
% Negative	48.9%	49.2%	54.2%	53.5%
obs(sig positive)	74	64	56	56
% Sig positive	12.6%	10.9%	9.5%	9.5%
obs(sig negative)	61	58	74	66
% Sig negative	10.4%	9.8%	12.6%	11.2%

4. QGC Pty Limited (formerly Queensland Gas Company Limited, ASX code QGC). Richard Cotte was the CEO from October 2002 to November 2008.
5. Mirvac Group (ASX code MGR). Gregory Paramor was appointed as the CEO in June 2001, and resigned in May 2011.
6. Clough Limited (ASX code CLO). David Singleton was the CEO from August 2003 to January 2007.

For each of these companies we estimated the CAPM, the Market Model, the Fama–French three-factor model and the Carhart four-factor model using data from the SPPR database held at Sirca over the period of time during which the CEOs listed above were in that position.¹⁷ The index value we used is a weighted value of all companies in the SPPR database. For illustration we used monthly returns, though SPPR does allow these models to be estimated with more granular observations. Our results are presented in Panels A and B of Table 10, where the results in Panel B are based on returns including the value of dividend imputation franking credits. In summary, the results in Panel A show that:

- Caltex and QGC have a significant positive α , ranging from 4.44 to 5.48% per month; David Reeves and Richard Cotte would be judged to have delivered significant shareholder wealth creation, and hence they would be entitled to participate in the full bonus pool, however, this bonus would not be paid immediately, and would vest over several years, in accordance with principle 3;
- The α of Telstra, Air New Zealand, and Mirvac is insignificantly different from zero; Solomon Trujillo (Telstra), Robert Fyfe (Air New Zealand), and Gregory Paramor (Mircvac), while not delivering significantly positive performance, were the CEO during a period where Telstra, Air New Zealand and Mirvac respectively earned, on a risk-adjusted performance, almost exactly what would be expected under the CAPM, the Market Model, or the multifactor models and during this period of time Solomon Trujillo and Robert Fyfe would earn a bonus, though it would not be the full award while Gregory Paramor had performance that was also statistically indistinguishable from zero, and hence would be considered for a bonus payment, which would, however, be lower than that for the Telstra and AirNZ CEOs, because the magnitude of the negative α for Mirvac is substantially larger than that for Telstra and Air New Zealand—in all three cases these bonus payments would vest over several years;
- David Singleton managed Clough Limited during a period of time where the risk-adjusted sharemarket performance was significantly negative; he would be not entitled to performance-based incentive payments or a termination bonus.

The results in Panel B of Table 10 are qualitatively and quantitatively similar to those in Panel A, suggesting that, for the six prominent ASX listed companies, the adjustment for dividend imputation franking credits does not alter the evaluation of risk-adjusted sharemarket performance over the period of time during which the CEOs were in the position.

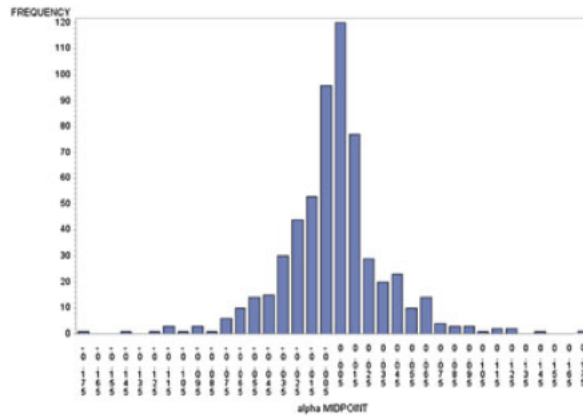
¹⁷ We thank Adrian Lee for sharing the series of pricing factors in Australia.

Table 11 shows the distribution of α estimated from four different models for all Australian CEOs who were in the position for at least one year. The date of CEO appointment and the date of resignation are sourced from Sirca Limited and Boardroom. We only consider CEOs who have left their position because both databases contain a large number of missing or obviously incorrect values in either date of appointment or date of resignation. Due to estimation requirements, we use monthly stock price data and only examine CEOs who were in the position for at least 12 months. To ensure the efficiency of the security prices, we eliminate observations with stale closing price (i.e., the closing price of current month comes from an earlier month). Figures 7, 8, and 9 are observations on the estimated α for four different

FIGURE 7

THE DISTRIBUTION OF ALPHA ESTIMATED FROM THE CAPM MODEL AND THE FAMA FRENCH THREE FACTOR MODEL OVER THE PERIOD OF TIME DURING WHICH THE CEOs WERE IN THAT POSITION

Panel A: All CEOs for the CAPM model



Panel B: All CEOs for the CAPM model (including dividend imputation franking credits)

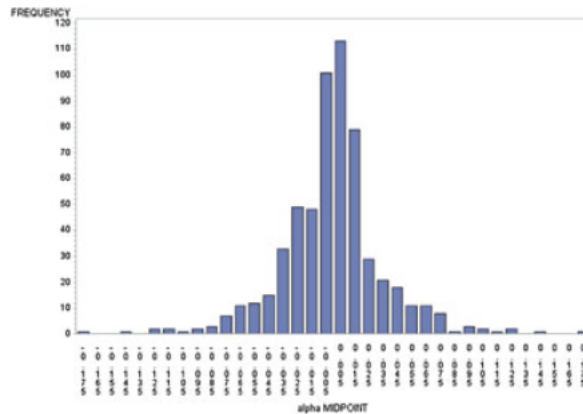
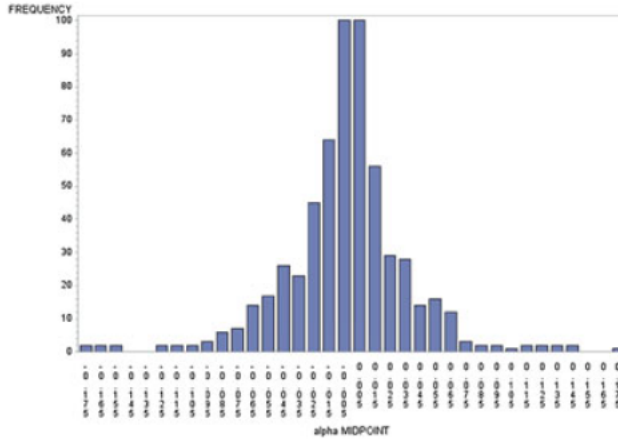


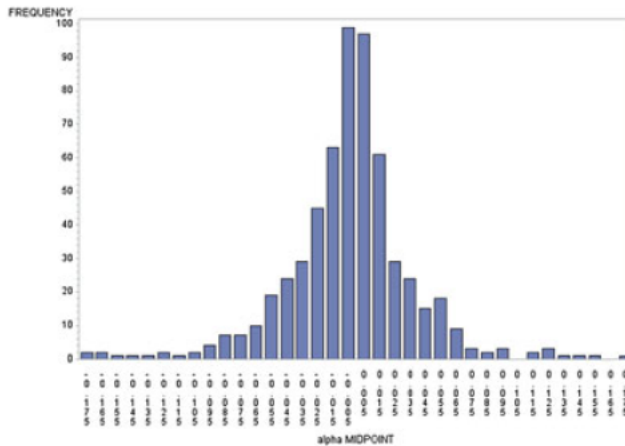
FIGURE 7

CONTINUED

Panel C: All CEOs for the Fama-French three-factor model



Panel D: All CEOs for the Fama-French three-factor model (including dividend imputation franking credits)



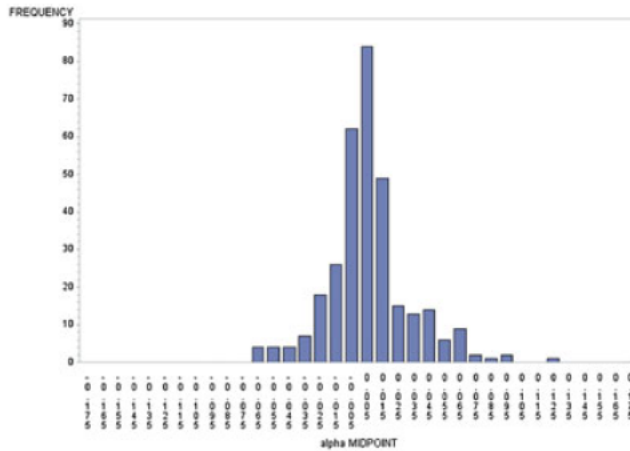
models without (Panel A) and with (Panel B) adjustment for dividend imputation franking credits.

- The mean value of estimated α for CAPM is positive (0.0003), while the other three models report a negative mean value of α . The estimated α from the multi-factor models tends to be more dispersed, with a higher standard deviation compared to that of the CAPM and the Market model.
- The risk-adjusted sharemarket performance during the period when CEOs were in the position is positive for 52.6% and 51.1% of CEOs according to the CAPM and the Market model respectively. The ratio of positive α is lower for the

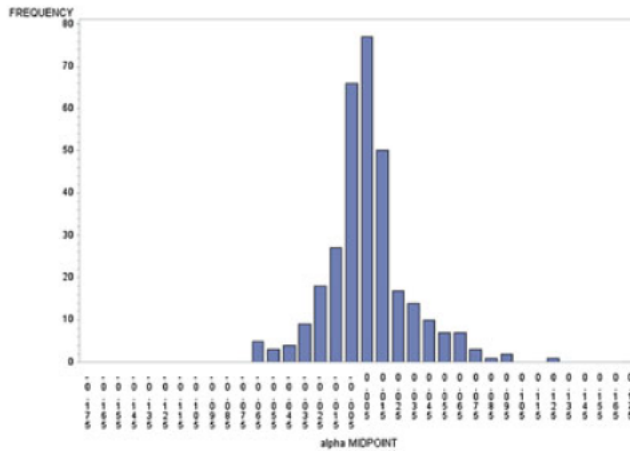
FIGURE 8

THE DISTRIBUTION OF ALPHA ESTIMATED FROM THE CAPM MODEL OVER THE PERIOD OF TIME DURING WHICH THE CEOS WERE IN THAT POSITION

Panel A: CEOs who had been in the position for more than three years



Panel B: CEOs who had been in the position for more than three years (including dividend imputation franking credits)



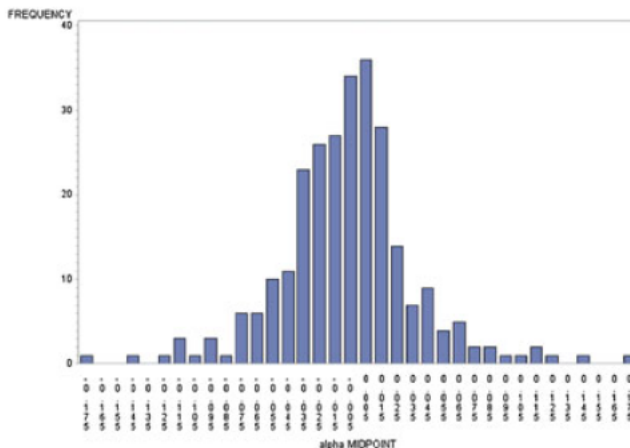
multifactor models. Consistently, the ratio of negative α for the CAPM and the Market model is lower than that for the multifactor models. Similarly, the number and percentage of statistically significant positive α is higher for the CAPM (12.2%) and the Market model (11.5%), while the multifactor models result in a higher percentage of significantly negative α (12.2% and 11.2% respectively).

- After the adjustment for dividend imputation franking credits, the ratio of positive (negative) α becomes lower (higher) compared to the estimates with no

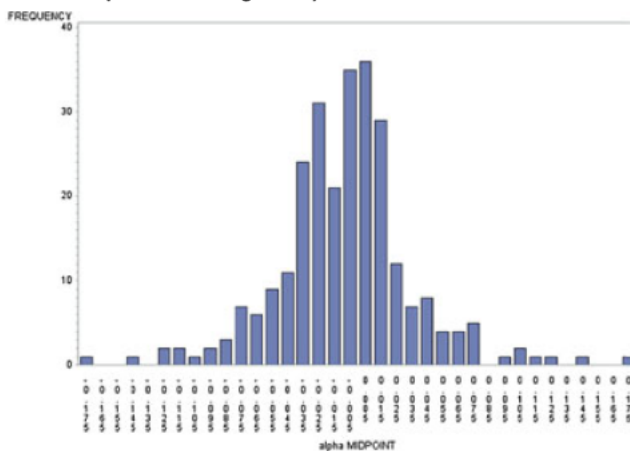
FIGURE 8

CONTINUED

Panel C: CEOs who had been in the position for less than three years



Panel D: CEOs who had been in the position for less than three years (including dividend imputation franking credits)

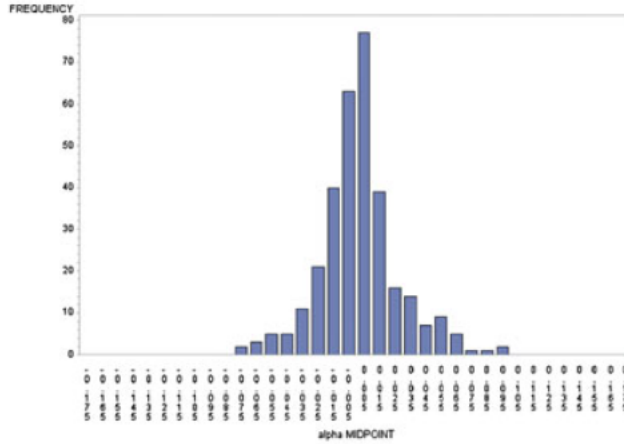


adjustment. For example, the risk-adjusted sharemarket performance during the period when CEOs were in the position is positive for 51.1% and 45.8% of CEOs respectively according to the CAPM and the Fama–French three-factor model. Importantly, the number and percentage of statistically significant positive α is higher for the CAPM (12.6% compared to 12.2% without adjustment), and the percentage of negative α is also higher (10.4% compared to 9.5%). This confirms the importance of including dividend imputation franking credits when evaluating risk-adjusted sharemarket performance.

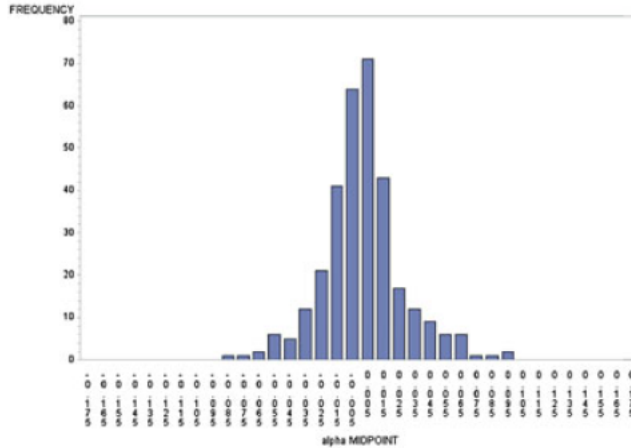
FIGURE 9

THE DISTRIBUTION OF ALPHA ESTIMATED FROM THE FAMA FRENCH THREE FACTOR MODEL OVER THE PERIOD OF TIME DURING WHICH THE CEOS WERE IN THAT POSITION

Panel A: CEOs who had been in the position for more than three years



Panel B: CEOs who had been in the position for more than three years (including dividend imputation franking credits)

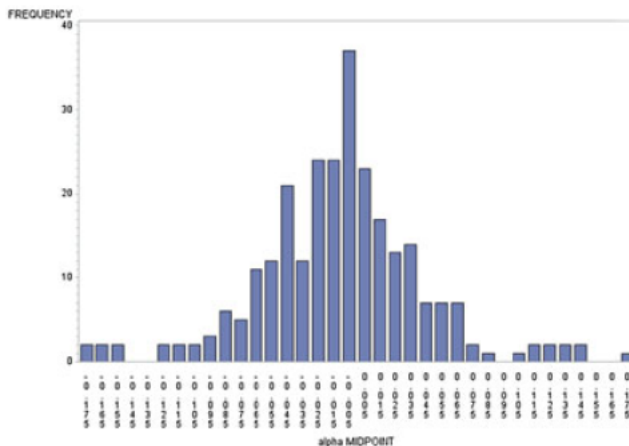


We also compare the estimated α between CEOs who had been in the position for more than three years ('long-service CEO') and those who worked as the CEO for less than three year ('short-service CEO'). The results are presented in Table 12. Importantly, we find that the mean value of the estimated α for 'long-service CEOs' is positive for all four models, and is higher than the mean negative α for 'short-service CEOs'. The risk-adjusted sharemarket performance for 'long-service CEOs'

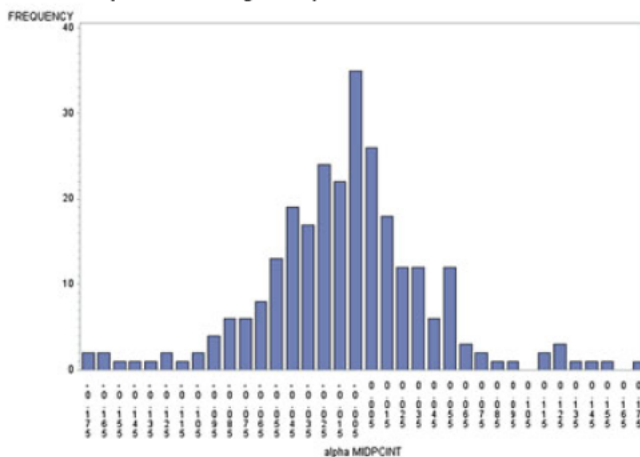
FIGURE 9

CONTINUED

Panel C: CEOs who had been in the position for less than three years



Panel D: CEOs who had been in the position for less than three years (including dividend imputation franking credits)



has a higher percentage of positive and significant values, and a lower percentage of negative estimated values, compared to ‘short-service CEOs’. Consistent with the above results, the ratio of positive (negative) α becomes lower (higher) after including dividend imputation franking credits. However, the percentage of statistically significant α (either positive or negative) is generally higher for the CAPM model and the multifactor models.

Graphical representations of the distribution of estimated α for all CEOs, ‘long-service CEOs’ and ‘short-service CEOs’ estimated from the CAPM and the Fama–French three-factor model are reported in Figures 7, 8, and 9.

TABLE 12

SUMMARY STATISTICS OF THE ALPHA ESTIMATED FROM DIFFERENT MODELS OVER THE PERIOD OF TIME DURING WHICH THE CEOS WERE IN THAT POSITION

Panel A: CEOs who had been in the position for more than three years

	CAPM	Market model	Fama French three factor model	Carhart four factor model
N	321	321	321	321
Mean	0.0063	0.0051	0.0020	0.0024
Median	0.0030	0.0032	0.0010	0.0015
Standard deviation	0.0266	0.0264	0.0260	0.0254
Q1	0.0056	0.0072	0.0110	0.0090
Q3	0.0160	0.0149	0.0129	0.0119
obs(Positive)	196	190	171	174
% Positive	61.1%	59.2%	53.3%	54.2%
obs(Negative)	125	131	150	147
% Negative	38.9%	40.8%	46.7%	45.8%
obs(sig positive)	53	50	37	36
% Sig positive	16.5%	15.6%	11.5%	11.2%
obs(sig negative)	20	21	28	26
% Sig negative	6.2%	6.5%	8.7%	8.1%

Panel B: CEOs who had been in the position for less than three years

	CAPM	Market model	Fama French three factor model	Carhart four factor model
N	268	268	268	268
Mean	0.0069	0.0084	0.0103	0.0085
Median	0.0054	0.0067	0.0082	0.0108
Standard deviation	0.0441	0.0437	0.0534	0.0573
Q1	0.0288	0.0307	0.0407	0.0377
Q3	0.0137	0.0120	0.0160	0.0175
obs(Positive)	114	111	101	102
% Positive	42.5%	41.4%	37.7%	38.1%
obs(Negative)	154	157	167	166
% Negative	57.5%	58.6%	62.3%	61.9%
obs(sig positive)	19	18	17	17
% Sig positive	7.1%	6.7%	6.3%	6.3%
obs(sig negative)	36	37	44	40
% Sig negative	13.4%	13.8%	16.4%	14.9%

Panel C: CEOs who had been in the position for more than three years (including dividend imputation franking credits)

	CAPM	Market model	Fama French three factor model	Carhart four factor model
N	321	321	321	321
Mean	0.0057	0.0045	0.0015	0.0019

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TABLE 12

CONTINUED

Panel C: CEOs who had been in the position for more than three years (including dividend imputation franking credits)

	CAPM	Market model	Fama French three factor model	Carhart four factor model
Median	0.0027	0.0029	0.0005	0.0011
Standard deviation	0.0265	0.0265	0.0260	0.0254
Q1	0.0067	0.0082	0.0123	0.0099
Q3	0.0149	0.0152	0.0128	0.0123
obs(Positive)	189	186	168	174
% Positive	58.9%	57.9%	52.3%	54.2%
obs(Negative)	132	135	153	147
% Negative	41.1%	42.1%	47.7%	45.8%
obs(sig positive)	54	47	41	39
% Sig positive	16.8%	14.6%	12.8%	12.1%
obs(sig negative)	23	22	28	27
% Sig negative	7.2%	6.9%	8.7%	8.4%

Panel D: CEOs who had been in the position for less than three years (including dividend imputation franking credits)

	CAPM	Market model	Fama French three factor model	Carhart four factor model
N	268	268	268	268
Mean	0.0077	0.0091	0.0110	0.0091
Median	0.0060	0.0077	0.0091	0.0110
Standard deviation	0.0440	0.0438	0.0535	0.0574
Q1	0.0302	0.0315	0.0409	0.0388
Q3	0.0130	0.0120	0.0146	0.0170
obs(Positive)	112	113	102	100
% Positive	41.8%	42.2%	38.1%	37.3%
obs(Negative)	156	155	166	168
% Negative	58.2%	57.8%	61.9%	62.7%
obs(sig positive)	20	17	15	17
% Sig positive	7.5%	6.3%	5.6%	6.3%
obs(sig negative)	38	36	46	39
% Sig negative	14.2%	13.4%	17.2%	14.6%

CONCLUSIONS

Executive compensation has been controversial for many years. Controversies over executive pay have sparked outrage from some sectors and calls for increased regulation and reform. Yet others argue that knee-jerk reactions to perceived abuses of pay can lead to a host of unintended and inefficient outcomes. This paper argues that much of this controversy is due to executives being rewarded via contracts that

have weaknesses in design. We argue that few stakeholders in firms would object to appropriately generous compensation for managers whose performance results in abnormally high long-term shareholder wealth creation. We state a set of nine design principles, developed from our intuition and a review of the extensive theoretical, regulatory and empirical literature, that we suggest should be the fundamental building blocks for designing executive remuneration systems in listed companies, especially where ownership and control is separated. Our purpose is to generate broad debate and discussion hopefully leading to a consensus as to the principles that should be present in all executive compensation contracts such that the interests of shareholders and managers are aligned.

We illustrate the principles we have developed using six well-known ASX listed firms managed by high-profile CEOs. While these firms were not chosen randomly, the illustration is robust to the various methods we use to estimate risk-adjusted sharemarket performance.

It goes without saying, perhaps, that comments, criticisms, and suggestions are welcome.

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