

Are we paying our CEOs too much?

CEO remuneration is always a headline issue.

ZOLTAN MATOLCSY and **ANNA WRIGHT** go beyond the headlines to determine the relationship between CEO remuneration and the economic characteristics of the firm.

The level of CEO compensation and the link between CEO compensation and firm performance has been extensively questioned by investors, politicians and the media in recent times. Much of the debate concentrates on the levels of compensation awarded to the CEO, and expresses cynicism in whether the level of CEO compensation is related to increases in firm performance.

For example, Allan Fels wrote in *The Australian Financial Review*, "CEO compensation levels are growing at a rate out of step with the value they are actually providing to their employers, the shareholders. Millions of dollars of shareholders' funds are being wasted".¹

However, such opinion pieces provide little or no evidence to support their arguments, but despite this, there has been very little investigation by the academic community into the determinants of the levels of Australian CEO compensation, with only limited evidence provided by Chalmers, Koh and Stapledon (2006) and Coulton and Taylor (2002).

The objective of this study is to provide the first detailed evidence on the relation between firm characteristics and the levels of Australian CEO compensation. Thus this study provides regulators and investors with information that could assist with their respective legislative and investment decisions.

The evidence presented in this study is based on a sample of large Australian

firms for the period 1999 to 2001, a total of 696 firm years. All accounting and compensation related data are available from the "UTS-Accenture Who Governs Australia" Database, while stock price information is collected from SIRCA.²

Our key findings indicate that rather than being randomly decided, levels of Australian CEO compensation are associated with underlying economic characteristics of the firms – around 41.5% of the total level of CEO compensation can be explained by firm characteristics.

Specifically, the results indicate that the level of CEO compensation is positively related to firm size, firm complexity and current market performance, which is consistent with the theory of the determinants of CEO compensation.³ Thus this study makes a significant contribution to the current debate on Australian CEO compensation levels as it provides evidence that levels of compensation are related to the underlying economic characteristics of firms.

THEORY DEVELOPMENT AND HYPOTHESIS

Jensen and Meckling (1976) suggest that the level of CEO compensation is set to minimise agency costs and maximise firm value. Following this traditional agency perspective, Core, Holthausen and Larcker (1999) state that shareholders choose a CEO compensation contract in order to maximise firm value based on the firm's



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information environment, and its demand for quality in the CEO.

They argue that if there is optimal CEO contracting, the economic determinants of the levels of CEO compensation would describe all of the cross-sectional variation in CEO compensation observed. Further, they suggest that the economic determinants that drive the level of CEO compensation are those that determine the level of quality required in the CEO, and the relative quality of the CEO, in turn, determines the level of compensation, with higher quality CEOs demanding higher compensation.

In identifying the firm characteristics that drive the level of quality required in the CEO, Core, Holthausen and Larcker (1999) cite Rosen (1982) and Smith and Watts (1992), who predict that larger firms, firms with more growth opportunities and firms with more complex operations demand higher quality CEOs and therefore pay higher compensation.

Past firm performance is also suggested to determine the level of CEO compensation, as Jensen and Murphy (1990), Hermalin and Weisbach (1998) and Hermalin and Wallace (2001) argue that future salaries increase in response to good firm performance. Firm risk is also included as a determinant of CEO compensation, following the arguments of Banker and Datar (1989) that compensation risk (and thus the level of compensation) could either increase or decrease with firm risk.

Consequently, Core, Holthausen and Larcker (1999) predict that larger firms, firms with more growth opportunities and firms with more complex operations and better past performance demand higher quality CEOs and therefore pay higher compensation.

However, although firm characteristics could drive the optimal compensation contract choice, optimal contracting might not be observed within all firms at all times. Core, Guay and Larcker (2003) argue that optimal compensation contracting arrangements evolve over time as firms experiment with new types of incentive contracts and update their beliefs about optimal incentive levels, although they could still be uncertain as to the efficient contract.⁴ Milgrom and Roberts (1992) also state that in compensation contracting, people learn over time, and organisations adapt by experimentation and imitation.

This study adopts the traditional agency perspective, and expects that on average, the levels of CEO compensation are set based on the underlying economic characteristics of the firm that determine the relative demand for quality in the CEO. Thus it is predicted that the level of CEO compensation is related to the underlying economic characteristics of the firm that determine the relative demand for quality in the CEO.

SAMPLE SELECTION AND RESEARCH DESIGN

The sample is drawn from those firms contained in the “UTS–Accenture Who Governs Australia” Database. The sample selection process for inclusion in the database starts with all firms included in the “Top 500” Australian firms⁵

(by market capitalisation) for the years 1999, 2000, and 2001. Deleted from the sample are investment trusts and managed funds, which are subject to different governance and reporting requirements. Also deleted from the sample are firms reporting in foreign currency, firms where management were paid by another company, firms with missing data⁶, and firms listed during the year.

Firms are also deleted from the sample where two years of prior data was not available, as at least two years of data is needed for the ex ante return variables. Finally, firms that changed their CEO during the year are excluded for that year only, as the outgoing CEO’s compensation typically includes some type of separation payment which is not separately reported, while the incoming CEO typically receives some type of signing bonus, again not separately reported (Coulton and Taylor 2002). The final sample comprised 227 firms for 1999, 224 firms for 2000 and 245 firms for 2001. Table 1 summarises the sample selection procedure.

	1999	2000	2001	Total
Original sample	513	510	507	1,530
Reason for deletion:				
Investment trusts and managed funds	77	69	55	201
Missing data	10	12	20	42
Management paid by another firm	12	14	13	39
Foreign currency	22	25	20	67
Listed during year	1	23	30	54
Prior 2 years of data not available	139	93	70	302
CEO change	25	50	54	129
Final sample⁷	227	224	245	696

All CEO compensation and firm accounting data is obtained from the “UTS–Accenture Who Governs Australia” Database. Total CEO compensation is measured using the bonus paid in the year following (instead of the bonus paid in the current year) in order to control for the lagged nature of bonuses.⁸ Options granted in the year are valued using the Black-Scholes formula, with adjustment for dividends.

RESEARCH DESIGN

As discussed earlier, it is predicted that larger firms, firms with more growth opportunities and firms with more complex operations will demand higher quality CEOs and therefore pay higher compensation. This study proxies for firm size with the log of the market value of equity, growth opportunities with the market to book ratio and firm complexity with the log of total subsidiaries and the log of total foreign subsidiaries.

Also included as possible determinants are past firm performance, measured using both market returns (adjusted for dividends) and return on assets (ROA); firm risk, measured as the standard deviation of return on assets over the prior three years; and two measures of current performance – ROA and market return (adjusted for dividends).

As these firm characteristics are expected to determine the firm’s relative demand for a certain level of quality in their

CEO and consequently the level of compensation at the beginning rather than at the end of the financial period, these factors are ex ante predictors of the level of the compensation.

Consequently, all economic characteristics are measured during the year prior to that in which the level of compensation is measured, except for current performance. The summary of the definitions and measurements of the variables used to proxy for the firm's economic characteristics are described in Table 2.

TABLE 2 ECONOMIC CHARACTERISTICS OF THE FIRM THAT ARE PREDICTED TO DETERMINE THE LEVEL OF CEO COMPENSATION

Variable	Predicted sign	Variable name	Proxy used
Size	+	Size _{t-1}	Log of the market value of equity
Past performance	+	Perf ^{SR} _{t-1}	Prior year share return, dividend adjusted
	+	Perf ^{ROA} _{t-1}	Prior year return on assets (ROA), measured as EBIT divided by the average book value of assets
Growth opportunities	+	MktBk _{t-1}	Market-to-book ratio
Risk	+/-	Risk _{t-x}	Standard deviation of ROA over prior 3 years
Complexity	+	Complex ^{sub} _{t-1}	Log of number of subsidiaries
	+	Complex ^{subfor} _{t-1}	Log of number of foreign subsidiaries
Current performance	+	CurrPerf ^{SR} _t	Current year share return, dividend adjusted
	+	CurrPerf ^{ROA} _t	Current year return on assets (ROA), measured as EBIT divided by the average book value of assets

In order to test the relation between the levels of CEO compensation and the predicted firm characteristics, we estimate the following cross-sectional regression:

$$TotalComp_{it} = \eta_0 + \eta_1 Size_{it-1} + \eta_2 Perf^{SR}_{it-1} + \eta_3 Perf^{ROA}_{it-1} + \eta_4 MktBk_{it-1} + \eta_5 Risk_{it-1} + \eta_6 Complex^{sub}_{it-1} + \eta_7 Complex^{subfor}_{it-1} + \eta_8 CurrPerf^{SR}_{it} + \eta_9 CurrPerf^{ROA}_{it} + \epsilon_1 \tag{1}$$

Where:

TotalComp_{it} = natural log of total compensation awarded to the CEO in the year, using lagged bonuses and valuing option grants using Black-Scholes

Other variables = as per Table 2 above.

RESULTS AND CONCLUSIONS

Table 3 shows the overall sample distributions of the firm characteristics identified as being relevant to the level of CEO compensation for the sample. Due to missing data, the overall sample is reduced to 672 observations, and 601 observations for the risk variable.⁹

TABLE 3 DESCRIPTIVE RESULTS

	Total sample			
	n	Mean	Median	Std dev
TotalComp _{it}	672	13.215	13.122	1.006
TotalComp _{it} – unlogged \$	672	939,677	499,910	1,272,805
Size _{t-1}	672	19.306	18.972	1.670
Size _{t-1} – unlogged \$	672	1,445,975,992	174,077,733	5,277,345,209
Perf ^{SR} _{t-1}	672	.313	.023	1.35
Perf ^{ROA} _{t-1}	672	.0234	.056	.199
MktBk _{t-1}	672	3.148	1.762	5.223
Risk _{t-x}	601	.0603	.0211	.114
Complex ^{sub} _{t-1}	672	1.847	2.602	3.51
Complex ^{subfor} _{t-1}	672	-2.275	.6932	5.477
CurrPerf ^{SR} _t	672	.1514	.070	.530
CurrPerf ^{ROA} _t	672	.0678	.080	.094

Where:

- TotalComp_{it} Log of total compensation using lagged bonuses and valuing options using Black-Scholes
- Size_{t-1} Log of the market value of equity
- Perf^{SR}_{t-1} Prior year share return
- Perf^{ROA}_{t-1} Prior year Return on Assets (ROA)
- MktBk_{t-1} Market-to-book ratio
- Risk_{t-x} Standard deviation of ROA over prior 3 years
- Complex^{sub}_{t-1} Log of number of subsidiaries
- Complex^{subfor}_{t-1} Log of number of foreign subsidiaries
- CurrPerf^{SR}_t Current year share return
- CurrPerf^{ROA}_t Current year ROA

Table 3 shows that during our sample period, the average total CEO compensation is \$939,677, and average firm size (lagged) is \$1,445,975,993. Table 4 (overleaf) provides the results for the regression analysis of levels of compensation on the economic characteristics of the firm.

TABLE 4 SUMMARY OF THE OLS REGRESSION COEFFICIENTS FOR THE RELATION BETWEEN TOTAL COMPENSATION AND UNDERLYING FIRM CHARACTERISTICS

The coefficients are based on the following equation:

$$\text{TotalComp}_{it} = \eta_0 + \eta_1 \text{Size}_{it-1} + \eta_2 \text{Perf}^{\text{SR}}_{it-1} + \eta_3 \text{Perf}^{\text{ROA}}_{it-1} + \eta_4 \text{MktBk}_{it-1} + \eta_5 \text{Risk}_{it-1} + \eta_6 \text{Complex}^{\text{sub}}_{it-1} + \eta_7 \text{Complex}^{\text{subfor}}_{it-1} + \eta_8 \text{CurrPerf}^{\text{SR}}_t + \eta_9 \text{CurrPerf}^{\text{ROA}}_t + \varepsilon_t$$

The *t* statistics are reported in brackets.

Variables	Predicted sign	Total sample
		N = 672
Intercept	+/-	7.187 (17.977**)
Size _{t-1}	+	0.308 (14.861**)
Perf ^{SR} _{t-1}	+	0.0043 (1.674)
Perf ^{ROA} _{t-1}	+	-0.246 (-1.259)
MktBk _{t-1}	+	-0.0127 (-1.865)
Risk _{t,x}	+/-	0.278 (1.003)
Complex ^{sub} _{t-1}	+	0.382 (3.438**)
Complex ^{subfor} _{t-1}	+	0.0261 (3.722**)
CurrPerf ^{SR} _t		0.0571 (4.387**)
CurrPerf ^{ROA} _t		0.792 (1.916)
Adjusted R ²		0.415
F ratio		48.146**

** significant at the 0.01 level (2-tailed) * significant at the 0.05 level (2-tailed)

Where:

TotalCompit	Log of total compensation using lagged bonuses and valuing options using Black-Scholes
Size _{t-1}	Log of the market value of equity
Perf ^{SR} _{t-1}	Prior year share return
Perf ^{ROA} _{t-1}	Prior year Return on Assets (ROA)
MktBk _{t-1}	Market-to-book ratio
Risk _{t,x}	Standard deviation of ROA over prior 3 years
Complex ^{sub} _{t-1}	Log of number of subsidiaries
Complex ^{subfor} _{t-1}	Log of number of foreign subsidiaries
CurrPerf ^{SR} _t	Current year share return
CurrPerf ^{ROA} _t	Current year ROA

Overall, the regression model shows that 41.5% of the total level of CEO compensation can be explained by firm economic characteristics. Specifically, the model shows that size, complexity and current market performance are positive and significant as determinants of the level of total CEO compensation. The size and complexity results indicate that, consistent with theory, larger and more complex firms require higher quality CEOs and consequently pay higher wages to them. The results imply that for a 10% increase in firm size (measured as market value of equity), CEO

compensation is forecast to increase by 3.08%, while for a 10% increase in total subsidiaries or total foreign subsidiaries, CEO compensation is forecast to increase by 3.82% and 0.26% respectively.

The regression model also indicates that on average, higher compensation is associated with better market performance. However, the economic significance of this finding is very small, as the result implies that for a 10% increase (or decrease) in the market performance of the firm¹⁰, CEO compensation is expected to increase (decrease) by only 0.571% (which is around \$5,366 for the average CEO compensation in this sample).

This study provides detailed Australian evidence on the relation between firm characteristics and the level of compensation awarded to the CEO. Overall, these results could suggest that on average, the levels of CEO compensation observed in Australia are not randomly decided, but are rather related to the various underlying economic characteristics of the firm predicted to drive levels of CEO compensation.

However, this study predicted only 41.5 % of total CEO compensation. Further investigation could be made into other possible determinants of CEO compensation, such as the international market for CEOs' services, the presence of CEO specialist skills or education and CEOs' preferences, which have not been investigated here. Further investigation could also be made into the relation between firm performance and CEO compensation. However, despite these limitations, this paper provides important initial evidence on the way in which the level of CEO compensation is determined in Australia.

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Notes

¹ *The Australian Financial Review*, 10 February 2004, article 10, page 54.

² Securities Industry Research Centre of Asia-Pacific

³ The theory is discussed further in section 2.

⁴ In addition, transactions costs reduce the opportunities for firms to continuously re-contract until an optimal solution is found. Core, Guay and Larcker (2003) state that one main difference between the efficient and inefficient contracting views are in the treatment of the transactions costs required to correct sub-optimal contracts. They argue that an implicit assumption of inefficient contracting is that the transactions costs are so great that firms cannot re-contract when inefficiencies arise, while efficient contracting assumes that there are no transactions costs at all, and that firms can continuously re-contract [for example, see Demsetz and Lehn (1985)].

⁵ As listed on Connect 4 (an electronic financial statement database of the top 500 Australian firms). Firms that drop out or join the Top 500 during the sample period are included in the analysis where they pass the sample requirements.

⁶ In that the data was not included in the annual report of the company, nor could be found in later annual reports, nor in information given to the shareholders at the annual general meetings.

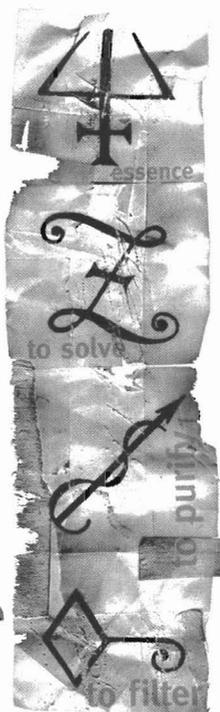
⁷ Due to data deletions, only 121 firms appear in all three years.

⁸ Many annual reports state that the bonus for the current year is paid and reported in the following year.

⁹ All outliers are identified using the procedure in SPSS, and are winsorised.

¹⁰ That is, a 10% change in the market return (e.g. from 10% to 20%).

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