An Examination of Economic Value Added and Executive Compensation

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An Empirical Investigation of EVA and Executive Compensation

ABSTRACT

Despite a growing literature, the relationship between the structure of executive compensation and firm performance is not fully understood. Furthermore, little work has been done on the link between Economic Value Added (EVA) as a measure of firm performance and the form of executive compensation. An examination of the compensation structure and economic value added of 209 companies in 1995 – 1998 provides evidence supporting incentive compensation. Economic Value Added is found to be positively and significantly related to incentive based compensation. Cash based remuneration, was found to be unrelated to EVA performance.

Keywords: Executive Compensation; Economic Value Added; Australia.

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1.0 INTRODUCTION

The objective of this paper is to evaluate the alignment of EVA[1] with management pay incentives in an agency theory context. Agency theory has been widely applied to the study of executive compensation in an endeavour to establish whether executive rewards are being set in a manner consistent with the theory. The theory posits that the sensitivity of executive pay to firm performance will be dependent upon risk sharing considerations, the level of monitoring of the executive by the owners and the degree to which their respective incentives are aligned. O'Byrne and Stewart (1999), for example, show that a total compensation strategy based on a formula-driven, fixed target EVA bonus and an option grant is equivalent to an entrepreneurial package whose wealth is a function of changes in shareholder value (p.161). EVA provides a foundation for the establishment of an incentive system for rewarding management performance.

Despite extensive study, Finklestein and Hambrick (1996, p.285) suggest that 'in sum, a significant gap seems to exist between economic predictions of the consequences of executive compensation and actual empirical results.' Results for models of CEO incentives to both market and accounting return measures have produced only small explanatory power (Rosen, 1990). This study broadens prior research in the area of executive compensation by using EVA as a measure of value delivered to shareholders and reporting its alignment with CEO pay outcomes.

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2.0 BACKGROUND

Agency theory requires the separation of ownership (principal) from the management (agent) of a firm. This division leads to agency costs, where managers exploit their superior information (information asymmetry) to maximise their own utility. Rosen (1990), in distilling empirical executive compensation research, finds that the semi-log elasticity of executive compensation with respect to accounting rates of return is

[1] EVA is a trademark of Stern Stewart Management Services. EVA is based on the concept of economic profit which is measured by the residual of a firm's income after the cost of capital and operating expenses have been deducted

around 1.0, compared to a stock market return of approximately 0.1.[2] There has been much argument over the normative level of these elasticities with no consensus emerging; however, there does appear to be general agreement that the correlation is weaker than expected and that accounting returns are a more reliable predictor than market-based measures. (Refer to Rosen 1990; Pavlik, Scott and Tiessen 1993 and Hallock and Murphy 1999, for reviews.) With respect to the magnitude of the correlation, Jensen and Murphy (1990) argue that the relationship of executive pay relative to shareholder stock value has reduced in the past 50 years. They believe the upper and lower ends of executive pay distributions have been truncated resulting in an absence of management incentives.

Some authors have posited that market returns are the only correct measure, as these represent the real return to owners and are not 'at the discretion of management' (Coughlan and Schmidt 1985, p.48). Jensen and Murphy (1990) point out that paying executives according to accounting profits provides incentives to both manipulate accounting policy choice and to favour projects with short term profit returns over those that add long-run value. This view, held by many financial economists, has led to a concentration of research on market returns at the expense of the more closely correlated accounting returns. However, despite stock price performance being a popular base for analysing management compensation plans this base is not always a good indicator of whether management have created or destroyed value during a given year. Individual share prices will fluctuate and even within the context of an efficient market will not necessarily always reflect the true worth of a firm. Jarrell (1993) notes that 'positive' accounting theory – based on the premise that accounting methods develop to provide more cost-effective measures of performance in the absence of regulation or tax effects — supports the use of accounting measures of earnings. That is, the almost universal use of this measure in compensation contracts suggest that it is the most efficient available. Jarrell (1993, p. 80) further argues that the use of a profit measure 'shields executive compensation from market-wide fluctuations in equity values that are not caused by expected changes in fundamentals'. This view is supported by Jarrell and Dorkey (1992) and Sloan (1991), who both find strong correlations between accounting returns and market-based returns. The former discovered a stronger relationship between accounting returns and

[2] Semi elasticity being calculated as (*dlog(compensation)/dr*) where *r* represents the accounting or market rate of return.

market returns of individual companies than the market returns of a company and the market index over a five-year period.

EVA provides a potential alternative measure of performance that goes beyond the traditional market and accounting measures (albeit rooted in them) mentioned above. It therefore provides the opportunity to expand our knowledge of the determinants of executive pay. A number of studies attest to the efficacy of EVA as a measure of company performance. Tulley (1999) summarises a study that reveals superior stock market performance of companies which have adopted EVA compared to competitors using other valuation methods. The study, conducted by Stern Stewart, comprised of 67 publicly owned US EVA clients were compared to ten firms with similar Standard Industrial Classification Index (SIC) codes over a five year period. The findings suggest that EVA adopting companies consistently outperformed their competitors in terms of total returns to shareholders.

Chen and Dodd (1997) compared EVA to traditional accounting measures of valuation, EPS, ROE and ROA. A regression model of both EVA and accounting variables revealed that EVA contained significant information beyond traditional accounting measures. Research by Lehn and Makhija (1997) on 452 firms for the period 1985 – 1994 compared ROA, ROE, ROS (return on sales), RET (stock performance), EVA and MVA. Among their findings were that stock returns and EVA had a correlation coefficient of .59. Other accounting measures, ROE, ROA and ROS had coefficients of .46, .46 and .39 respectively, indicating a stronger correlation between EVA and stock return than the accounting measures.

3.0 DEVELOPMENT OF HYPOTHESES

As oultlined above numerous studies have identified a positive relationship between executive compensation and firm performance. Using Australian data, Evans and Stromback (1994) find lower (and statistically insignificant) elasticities when compared with US studies. Their results for executive pay with respect to accounting rates of return was statistically significant but with very small coefficients for the profit variable. This result is supported by a more recent Australian study that found that “consistent with prior allegations, it appears that Australian CEOs have had, by international standards, a relatively small proportion of total compensation at risk”

(Izan, Sidhu and Taylor 1998, p. 46). Despite the relative size of the effect, both studies supported a positive pay-performance relationship.

No prior Australian study could be located which tested the effect of executive remuneration on EVA returns. A recent US study using 1996 cross-sectional survey based data found a modest positive relationship between EVA and CEO base salary, cash bonus and long term compensation (Sheikholeslami, 2001). Interestingly, they also find no relationship with CEO option holdings, proffering that 'perhaps compensation committees hope that granting stock options will produce (future) results not currently reflected in (or anticipated by) current earnings and/or stock prices (p. 16)'. Nevertheless, the general finding of the study lends support to the contention that CEO cash compensation and shareholdings are positively related to EVA.

Indirect support for this finding may also be gleaned from the many studies reporting a positive pay-performance relationship (Rosen, 1990) when the performance measures used, both market and accounting based, contain elements which are used in the computation of EVA. Given the above, it would be expected that EVA, which is based on accounting returns but includes market elements (market value of equity and the capital charge) would similarly be positively related to executive compensation. Hence:

H_1: Ceteris paribus, CEO cash and bonus pay will be positively related to computed EVA.

Agency costs arise where managers exploit their superior information to maximise their own utility. Where the CEO has significant investment in the company, the division between owners and managers is minimised and should, in theory lead to a reduction in agency costs. To the extent that companies have CEOs with significant share holdings they essentially become management-controlled-and-owned companies, and therefore are less subject to moral hazard problems (Antle and Smith, 1985).

Support for this is found in Lambert and Larker (1987) in a study of executive compensation effects of large corporate acquisitions. In establishing that CEO

compensation could not be increased through the selection of acquisitions that reduced shareholder wealth, they noted:

> … the executives of the firms whose acquisitions were associated with a negative stock price reaction typically owned a smaller percentage of their firms stock than did the executives of the firms whose acquisitions were associated with a positive stock price reaction (p. 238).

Other evidence of the mitigating effect of stock ownership on aberrant management behaviour can be found in Dhaliwal, Salamon and Smith (1982) where it is shown that managers with significant shareholdings in their company's stock were less likely to manipulate earnings. This is consistent with Dechow and Sloan's (1991) finding with respect to opportunistic reduction in research and development expenditures. In their investigation of the 'horizon problem' in firms, they find that executives in their final years spend less on research and development; the implication being that short-term accounting performance is 'managed' to maximise the executive's eventual retirement benefit. They also establish that this effect was reduced in firms where executives held shares or options. Similarly, Kaplan and Atkinson (1989, p. 724), in promoting the use of equity linked performance measures over accounting results, provide an extensive list of actions managers may take to improve reported earnings and yet provide no long-run benefit to the firm. They further argue that executives could decline investments that increase the net present value of the firm but penalise short-run earnings. Taken together, these studies lead to the proposition that the remuneration of managers with significant share holdings will be more related to performance effects and less to scale effects than for those with insignificant share holdings. Hence:

H_2: Ceteris paribus, the proportion of firm equity held by the CEO will be positively related to computed EVA.

Under agency theory, the agent (CEO) is attempting to maximise their utility within the constraints imposed by the principal (owner). In the situation where only the agent's output is observable, but his/her effort level is not, Holmstrom's (1979) model solution includes an incentive to the agent based on output. In these terms, we could view the cash component as largely equating to insurance (not completely as it may include an incentive based bonus) and equity returns as incentives. The CEOs exposed to the greatest incentive, will be those with the largest incentive-based payments relative to insurance, all else being equal. Llewellen, Loderer and

Rosenfeld (1985) found that executives with personal share holdings that were relatively small when compared with their salary package were more likely to force their firms into acquisitions that reduced shareholder wealth. In this way the executives' wealth would be maximised through the firm-size effect on salary. It may be inferred from this that executives with relatively high personal share holdings may be less interested in scale effects and more concerned with the factors that influence the market value of the firm. As such, the absolute value of the output-linked incentive (i.e. equity returns) is more meaningful when compared to the insured portion of their remuneration (i.e base salary). In simple terms, a CEO with a salary of $1 million and equity holdings of $2.0 million would be considered to have an equivalent incentive to a CEO with salary of $5 million and equity holdings returns of $10.0m. In this way, an attempt is made to gauge the relative importance of the equity incentive. Hence;

H_3: Ceteris paribus, Incentive based pay as a proportion of total CEO pay will be be positively related to computed EVA.

4.0 RESEARCH DESIGN

4.1 Sample determination

The sample, based upon companies reported in Shareholder (July 1999), is defined as the top 500 Australian Stock Exchange listed companies by market capitalisation. To ensure consistency of reporting period, companies with June 30 year-ends were removed. Similarly, no liability companies, property trusts and companies reporting in foreign currencies were excluded from the initial sample population as differing financial reporting requirements apply. From the remainder, 250 companies were randomly selected with further reductions in sample size arising from missing data detailed below.

Firstly, in 20 cases, the board of directors was entirely comprised of non-executive directors and therefore no information on CEO shareholding was obtained. The CEO's shareholding is a mandatory disclosure in the company's annual report only if the CEO is a company director. Secondly, 8 companies reported a change of CEO during the current or previous financial year that led to a significant distortion of the cash pay recorded in the annual report. A further 13 companies were controlled by

management companies and did not disclose details of CEO remuneration. The listwise effect of the missing data reduced the sample size to 209 observations. The study period was 1995 to 1998 inclusive.

4.2 Variable Definition

The proportion of firm equity held by the CEO (CEO proportion)

Disclosure of the CEO's shareholding is a requirement of the Australian Corporations Law under section 307(1)(b) when the CEO is a member of the Board of Directors. This section requires company directors to disclose their relevant interest in shares of the company or of any related body corporate. The definition of 'relevant interest' extends the disclosure to all shareholdings where the director has control over voting power. The proportion is calculated by dividing the CEO shareholding by total fully paid issued capital as at 30 June 1998. Whilst acknowledging that the inclusion of equity rewards arising from CEO option awards would be an important extension to this study, these were excluded due to difficulties in data collection. As at 30 June 1998, the only disclosure of option grants required in published financial statements was of the total options held by the CEO at year end. The available data is insufficient to allow any form of option valuation.

CEO cash and bonus pay (CEO pay)

Executive remuneration is disclosed in company annual reports in accordance with the Applicable Accounting Standard AASB 1034: Information to be Disclosed in Annual Reports, compliance being mandatory under the Australian Corporations Law. AASB 1034 requires the inclusion of all income (i.e. money, consideration or benefits) in its determination. Pay data is disclosed in the company annual report in the form of a frequency table commencing at a pay level of $100,000 and grouped by $10,000 increments. The highest executive pay band is taken to represent CEO cash remuneration (i.e. salary plus cash bonus).

Incentive Based Pay (CEO incentive)

This measures the value of CEO equity holdings relative to cash pay to establish a measure of incentives included in the total pay package. This measure does not include executive options and is recognised as a limitation of the study.

Economic Value Added Per Share (EVAPS)

EVA is the residual income[3] remaining after subtracting the cost of a firm's capital from its net after tax operating profits and is defined as follows.

EVAPS = EVA ÷ total number of issued ordinary shares at year end.

Where; EVA = NOPAT$^{(a)}$ - (Cost of Capital$^{(b)}$ x Capital Employed$^{(c)}$)
And;
(a) NOPAT = Net Operating Profit after Tax = Sales – Cost of Goods Sold – Selling, General &Administration – Taxes
(b) Cost of Capital[4] is the Weighted Average Cost of Capital (WACC) and
(c) Capital Employed = Total Assets (excluding cash) – (Current Liabilities – Short Term Debt)

5.0 RESULTS OF THE DATA ANALYSIS

Table 1, presents the descriptive statistics of three main variables used in the study, namely, CEOProportion, CEOPay and CEOIncentive and background data on market capitalisation. The average market capitalisation of the sample companies is $761 million. Executives on average earn $0.56 million per year and own 1.7% of the companies they run.

[INSERT TABLE 1 ABOUT HERE]

[3] The residual income (RI) variable was obtained from Datastream. The Datastream variable assumes that all dividends are re-invested back into the stock. Which may lead to an upward bias over time in reported RI.

[4] Computation of Cost of Capital
Current Beta = directly from Datastream and is based on the last 60 months returns.
Risk free rate = 10 year Australian Bond
Risk premium = equity premium, period 1882 to 1998 – 7.418%
A rated bonds and assumes a constant tax rate = 36%

Table 2 reveals the relationship between the sample company stock returns and computed EVAPS. Consistent with the findings of Chen and Dodd (1997), an estimated 31% of the variation in stock price (standard error) can be explained by the EVA measure (compared to r =0.449 for their study). As noted by them 'while an individual company may find a better link between EVA and stock return, or even a near perfect one as claimed by EVA advocates, the proposition cannot be generalised to a large cross-sectional sample (p. 325)'.

[INSERT TABLE 2 ABOUT HERE]

Table 3 shows a positive pairwise correlation with each of the independent variables under examination. The strongest association exists between log CEOPay and CEOIncentive (r=0.526). The raises the possibility of the existence of multicollinearity in the model, which can adversely effect both the least squares point estimates as well as the ability to draw finite inferences from computed *t* statistics and *p* values. Tabachnik and Fidell (1996, p. 86) contend that correlations as low as 0.7 may will be a strong indicator of multicollinearity, suggesting redundant variables that could be omitted or merged into a composite score. The Pearson correlation Table 2 shows that none of the variables in the model exceed the 0.7 maximum.

The absence of substantial bivariate correlation does not in itself ensure that the model is free from multicollinearity as changes in an independent variable may be partially explained by changes in a number of other independent variables. The strength of this linear relationship can be measured via the tolerance statistic or its inverse the variance inflation factor (VIF). None of the independent variable exceeds the recommended VIF level of 10 (tolerance < 0.1), which represents severe multicollinearity (Eye and Schuster 1998, p. 137).

[INSERT TABLE 3 ABOUT HERE]

To investigate the relationship between the structure of executive compensation and EVAPS we estimate a regression as shown in Table 4. The three independent

variables represent different forms of compensation structure. The reported results in the tables are based on the averages of variables over 1995 – 1998. The coefficients of CEO Proportion and CEO Incentive are positive and statistically significant. This would suggest that firms with higher EVAPS values use equity based plans more extensively.

[INSERT TABLE 3 ABOUT HERE]

The results for cash compensation (cash pay) are different to those for equity based (proportion and incentives) compensation, with a negative (not significant) relationship between EVAPS and Cash Pay. In total, the empirical evidence presented gives support to hypotheses H_1 and H_3 but refutes H_2.

6.0 CONCLUSION

An examination of the relationship between executive compensation structure and firm performance finds a positive relationship between incentive based compensation and EVA. The evidence presented in the paper lends further support to those advocating incentive based compensation packages and is consistent with the theoretical work on Agency. It illustrates an additional dimension to the study of executive compensation beyond the traditional accounting and marketing measures, however in common with them, and consistent with the finding as of Sheikholeslami (2001) the explanatory power is relatively modest.

An interesting outcome of the study was the divergent influence of equity based versus cash based rewards on EVA performance. As was hypothesized equity based pay was positively linked to EVA performance, supporting the contention that where a CEO has significant investment in the company the division between owners and management is minimized and agency costs are reduced. It indirectly supports the Llewellen, Loderer and Rosenfeld (1985) findings that executives with personal share holdings that were relatively small when compared with their salary package were more likely to force their firms into acquisitions that reduced shareholder wealth. This infers that executives with relatively high personal share holdings may be less

interested in scale effects and more concerned with the factors that influence the performance of the firm.

In contrast, CEO cash pay was not significantly associated with EVA performance. This appears to be consistent with two prior Australian studies which found that Australian CEOs, by international standards, have a smaller proportion of ‘at-risk’ compensation (Evans and Stromback, 1994; Izan, Sidhu and Taylor 1998).

In conclusion, the findings for EVA should not be overstated as it is essentially an amalgam of accounting and market measures and continues to suffer from the weaknesses of both as a measure of performance (refer background section). Explanatory power with respect to CEO compensation in an Agency context continues to be modest, and as noted by others the extension of research beyond this paradigm is required.

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Table 1 Descriptive Statistics

Market Capitalisation $(M)	
Mean	761.7
Median	171.0
Standard Deviation	1994.7
Minimum	87.9
Maximum	22886.9

Chief Executive Officer Proportion[a] (%) - CEOProportion	
Mean	0.017
Median	0.005
Standard Deviation	0.058
Minimum	0
Maximum	0.382

Chief Executive Officer Pay[b] $(000) - CEOPay	
Mean	557.1
Median	351.2
Standard Deviation	919.1
Minimum	100
Maximum	4920

Chief Executive Officer Incentive[c] - CEOIncentive	
Mean	16.4
Median	0.82
Standard Deviation	37.1
Minimum	0.00
Maximum	180.5

(a) CEOProp = CEO shareholdings as a proportion of total issued ordinary share capital

(b) CEOPay = Cash pay plus other recorded FBT targets

(c) CEOInc = $\frac{\text{CEO Shareholdings x Market Price at end of year}}{\text{CEO Pay}}$

TABLE 2 Descriptive Statistics for Stock Return and EVA per Share

Variable	Mean	S.D.	Minimum	Maximum
Stock return[(a)]	9.64	10.26	-74.93	69.69
EVAPS[(b)]	-0.99	4.77	-101.00	5.29

EVAPS and Stock Returns

Correlation Coefficient = 0.561 r^2 = 0.315

(a) Correlation between computed EVA and stock returns for the period 1995-1998. All data extracted from Datastream and Connect 4 databases. Return is measured as the annualised average compound rate of return from investing in the sample stocks over the study period (1995 – 1998). The return is inclusive of dividends.

(b) Average EVA per share is the computed EVA divided by the number of shares on issue at end of year balance date.

Table 3 Descriptive Statistics for Continuous Independent Variables

	Independent Variable Correlation Analysis			Collinearity Statistics	
	1	2	3	Tolerance	VIF
1. CEOProp[(a)]	1.0	0.501	0.401	0.695	1.438
2. lnCEOPay[(b)]	0.501	1.0	0.526	0.358	2.796
3. CEOInc[(c)]	0.401	0.526	1.0	0.708	1.413

(a) CEOProp = CEO shareholdings as a proportion of total issued ordinary share capital

(b) lnCEOPay = log of CEO cash pay

(c) CEOInc = $\frac{\text{CEO Shareholdings x Market Price at end of year}}{\text{CEO Pay}}$

Table 4 Regression Analysis of CEO Pay Related Variables on EVA per Share

Variables[a]	**Coefficient**	***t* value**	***ρ* value**
CEOProp	0.139	2.721*	.012
lnCEOPay	-0.065	-1.517	.089
CEOIncentive	0.101	2.009*	.020
$R^2 = 0.198$	F = 17.662		

* denotes significance at the 5% level.

[a] A minitab model diagnostics was used to test for the presence of heteroscedasticity. In each case the residuals were small.