

## THE INCENTIVES OF AUSTRALIAN COMPANIES TO UTILIZE EXECUTIVE STOCK OPTION PLANS<sup>\*\*\*</sup>

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### Abstract

This study investigates the firm specific characteristics which provide ex ante incentives to Australian companies to utilize an executive stock option (ESO) plan. We hypothesize that the remuneration of the Chief Executive Officer, the firm's investment opportunity set, the level of leverage and the degree of international diversification of the firm are related to the firm's utilization of an ESO plan. Using a sample of 378 firms drawn from the largest 500 firms in Australia, we find that the results support our hypotheses, with the exception of the level of firm leverage.

**Keywords:** executive stock options; management remuneration

### 1. Introduction

The structure of executive compensation has been the subject of considerable research in recent times (Pavlik, Scott and Tiessen, 1993; Gaver and Gaver, 1995; Coulton and Taylor, 2002). It has been demonstrated that agency costs can be reduced by aligning managerial compensation to firm performance (Jensen and Meckling, 1976; DeFusco, Zorn and Johnson, 1991). To achieve such alignment, companies can choose from a wide array of incentive schemes which vary in their measurement of performance and in their time horizon (Smith and Watts, 1982). Payment of annual bonuses based on corporate or divisional profitability has been a part of remuneration packages for many years (Healy, 1985). Companies also use longer term incentive schemes such as the issue of stock options to senior executives. Executive stock option (ESO) plans have been used extensively in the United States and the United Kingdom (Rouse and Barton, 1993; Egginton, Forker and Grout, 1993) but only recently have they become an integral part of executive remuneration in Australia (Carr, 1997).

A number of studies in the United States have focused on the ex ante incentives which motivate firms to use ESO plans (Hite and Long, 1982; Lewellan, Loderer and Martin, 1987; Long, 1992; Skinner, 1993; Gaver and Gaver, 1995). Other studies have examined ex post effects such as share price reactions to such schemes (Larcker, 1983; Brickley, Bhagat and Lease, 1985; Agrawal and Mandelker, 1987; DeFusco, Johnson and Zorn, 1990).

Research in Australia has been mainly descriptive in nature, focusing on the relative usage of option schemes (Lawriwsky, 1982; The Hay Group, 1991; Remuneration Planning Corporation, 1992 and 1996). These studies have shown a steady increase in the use of employee option schemes in the last two decades.<sup>1</sup> Only a few studies have examined the determinants of management remuneration plans and ESO plan usage by Australian firms (McConnel, 1994; Evans and Stromback, 1996; Deegan, 1997; Coulton and Taylor, 2002). Coulton and Taylor (2002) found that CEO options are positively associated with firm size and prior period share performance and negatively associated

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<sup>1</sup> The Hay Group (1991) found 27% of companies in their sample offered some form of option plan to employees while the Remuneration Planning Corporation (1996) found that 41% of the top 350 companies had employee share plans which included options (Carr, 1997).

with CEO shareholdings. Contrary to their expectations, they also found ESOs to be positively associated with leverage and negatively associated with growth. Deegan (1997) found that the level of specificity of both the firm's resources and the manager's human capital investment affects the composition of the compensation package which the manager receives. McConnel (1994) found support for the hypothesis that the investment opportunity set influences the use of ESO plans. Evans and Stromback (1996) investigated the base pay of the CEO, the firm's international diversification and the firm's risk profile as potential variables explaining the likelihood that a firm would offer executive options. Risk profile and one measure of international diversification were significantly related to the use of ESO plans. However, another measure of international diversification and the base pay of the CEO were not found to significantly influence ESO plan usage.

In the current study we investigate the ex ante incentives which exist for Australian firms to adopt an ESO plan as a part of the remuneration package which is offered to their senior managers. Research into the use of ESO plans in Australia has been hampered by the low levels of disclosure relating to the remuneration of executives. However, a number of regulatory changes<sup>2</sup> in recent years with respect to the disclosure of employee entitlements now permit investigation of the relative usage by companies of ESO plans. As such information is now publicly available in the annual reports of companies, we are able to investigate a large sample, representing a more cross-sectionally diverse range of firms. This substantially reduces the limited external validity pertaining to prior research. We develop hypotheses to assess whether the level of remuneration (excluding options) paid to the Chief Executive Officer (CEO), the cross-sectional variation in the nature of firm assets<sup>3</sup>, the firm's leverage ratio and the degree of internationalization of the firm affect the firm's decision to include stock options in the remuneration package of executives. We find that there is a positive relation between the level of remuneration received by the CEO and the existence of an ESO plan. We also find that a firm is more likely to have an ESO plan in place as the proportion of assets represented by growth options increases and as the degree of international diversification increases. However, the level of firm leverage does not appear to affect the decision to use an ESO plan.

Our study provides empirical evidence on the extent to which ESO plans are currently being utilized by Australian firms. It also provides insight into the incentives driving the remuneration strategies of Australian companies. Our findings have implications for corporate governance, managerial contracting, labour relations and decision making by shareholders and potential investors. In particular, the results are useful to remuneration committees of companies when considering the design of efficient remuneration packages. The remainder of the paper is structured as follows. In section 2 we develop testable hypotheses while we describe our research method in section 3. The results of our study are reported and discussed in section 4. In the final section we draw some conclusions, note the limitations of the study and discuss opportunities for future research.

## 2. Hypothesis Development

### 2.1. Executive Stock Options as a Component of the Remuneration Package

A major goal of a managerial compensation package is to motivate managers to maximize firm value, thereby aligning their interests with those of the shareholders (Tang, Bowser and Williams, 1987). To operate most effectively as an incentive mechanism, the executive must perceive options to be bought by foregone pay and not merely to be an "add-on" to the existing compensation package (Evans and Stromback, 1996). The effect of this is that if the company's share price does not reach expected levels relative to the exercise price of the options, there is a real fall in the remuneration received by the executive. If such a trade-off exists for Australian companies, the total remuneration package (excluding options) would be lower in companies with executive options issued than those without. However, managerial remuneration packages also have the objectives of attracting and retaining executives (Tang, Bowser and Williams, 1987). Managers, wishing to maximize their personal utility, will seek to increase the size of the total compensation package. This is particularly im-

<sup>2</sup> Changes to disclosure requirements have occurred in the Australian accounting standards, the *Corporations Law* 1991 (Cth), and in the Australian Stock Exchange Listing Rules.

<sup>3</sup> The investment opportunity set, which was developed by Myers (1977) and further elaborated on by Skinner (1993), is used as the framework to elucidate the cross-sectional variation in firm assets.

portant for the CEO who, being at the top of the company's management hierarchy, does not have opportunities for promotion within the firm. An ESO plan may serve as a mechanism to increase total remuneration as opposed to being a replacement for other forms of remuneration.

Options may also be used to satisfy the objective of retaining executives because they operate as a form of deferred forfeitable remuneration. Performance targets and specified periods prior to which the options cannot be exercised operate to ensure the loyalty of the executive so that rewards are contingent on maintaining the employment relationship. Options, operating as deferred forfeitable remuneration, also increase the cost to competing firms who may attempt to recruit the manager. Thus, firms may offer stock options as an additional component of the remuneration package, to ensure managerial loyalty (Stradwick, 1996).

There may also be an indirect relationship between the existence of an ESO plan and the amount of CEO remuneration as both may be linked to the firm's investment opportunity set (Gaver and Gaver, 1995; Skinner, 1993). This link is discussed in the next subsection.

Evans & Stromback (1996), using a sample of 57 Australian firms, found no significant differences in base remuneration for the CEO between the companies which issued options, and those which did not. We therefore test whether this is the case for a larger sample of firms.

We have presented arguments for both a positive and a negative relationship between the use of ESO plans and the amount of CEO remuneration. Hence, a relationship is hypothesized but the direction of the relationship is not predicted.

*H1: The remuneration (excluding options) of the CEO is related to whether the firm has an ESO plan.*

## **2.2. The Investment Opportunity Set as an Explanation for the Use of ESO Plans**

Myers (1977) describes the firm as a combination of assets in place and future investment options. A distinguishing feature of investment (or growth) options is that their value depends on further discretionary expenditures by managers, whilst assets in place do not require such an investment. The investment opportunity set (IOS) of a firm is its unique combination of assets in place and growth options. The nature of the firm's IOS determines the costs and benefits of monitoring and motivating managers (Williamson, 1988). Smith and Watts (1992), Clinch (1991), Gaver and Gaver (1993) and Gaver and Gaver (1995) show that compensation policies are related to the investment opportunities of the firm. The studies find that growth firms have a significantly higher incidence of stock option plans than non-growth firms. Larger firms and firms with more growth options also pay higher levels of monetary compensation (Skinner, 1993; Gaver and Gaver, 1995). The costs and benefits of monitoring and bonding managers depend upon the investment opportunities of the firm (Anderson, Francis and Stokes, 1993; Ryan and Wiggins, 2001). Thus, it is contended that the utilization of ESO plans varies between firms according to the IOS of the firm.

Smith and Watts (1992) contend that the monitoring costs of firms with relatively more assets in place will be lower than those of firms largely comprised of growth options. This is because, in such firms, the investments which the manager chooses are easier to measure by those who do not have the specific knowledge of the manager (Deegan, 1997). As a result, the optimal remuneration contract is one which has a greater composition of fixed salary. Managers of firms comprised largely of growth options have a greater specificity of knowledge, and thus are more likely to be paid via incentive plans. Assets are more difficult to observe and accounting numbers are likely to be less reliable for firms with high growth options (Watts and Zimmerman, 1986). Hence, stock based incentive plans, which offer greater flexibility (Skinner, 1993), are more likely to be used than those based upon accounting earnings. These arguments lead to the hypothesis that firms utilizing ESO plans are more likely to have a higher proportion of firm value represented by investment opportunities or growth options. McConnel (1994), in a study of the top 100 Australian firms by market capitalization, found support for this hypothesis but Coulton and Taylor (2002), in a sample of 258 firms, obtained the opposite result. We therefore test whether our hypothesis holds in our sample of 378 firms.

*H2: A firm is more likely to use an ESO plan when the proportion of firm value attributable to assets in place is lower than when the proportion of firm value attributable to assets in place is higher.*

### 2.3. Executive Stock Options and Firm Leverage

A “nexus of contracts” view of the firm (Coase, 1937) implies that the design of executive compensation will reflect costs associated with the use of debt finance as well as the separation of ownership and control through public equity finance. Thus, it is likely that the level of firm leverage provides additional explanatory power in determining whether the firm uses an ESO plan. Firm leverage has consequences for the manager’s personal utility depending upon the composition of their remuneration package (Agrawal and Mandelker, 1987). Managers whose compensation package is comprised solely of fixed salary have primarily a fixed claim on the assets of the firm. As such, they will prefer a low degree of leverage in order to maximize the value of their fixed claim (Lewellen, Loderer and Martin, 1987).

Additionally, the leverage ratio directly affects the volatility of stock returns. The wealth of managers who hold executive stock options is directly related to the volatility of stock returns because options have a higher value when the variance of share prices is greater (Amram and Kulatilaka, 1999; Kolb, 1997). These arguments suggest that the use of ESO plans should be positively related to the level of debt. In contrast, however, Smith and Watts (1982) hypothesize a negative relationship based on asset substitution arguments. An agency cost of debt is the incentive for shareholders to transfer borrowed money to projects riskier than those envisaged by the lender. Where senior executives have contractual incentives which encourage them to take higher risk investment decisions, lenders may view their interests as threatened and impose higher lending costs on the firm (Whittred, Zimmer and Taylor, 1999; Coulton and Taylor, 2002). The level of debt may therefore be negatively related to the existence of an ESO plan. Empirical support for this hypothesis was provided by John and John (1993).

Conflicting theories have been presented as to whether the utilization of executive options is positively or negatively related to firm leverage. Furthermore, McConnel (1994) found evidence which partially supported the proposition that, if the effect of the firm’s IOS is removed, there is no correlation between leverage and the use of ESO plans. Hence, we test for a relation also controlling for the firm’s IOS but we do not predict the direction of the relation.

*H3: The likelihood of a firm utilizing an ESO plan is related to the firm’s leverage ratio.*

### 2.4. International Diversification of the Firm as an Incentive to use ESO plans

The relative usage of stock options as a remunerative tool should be influenced by the regulatory environment. In particular, the treatment of stock options by taxation laws and accounting standards is likely to be a major consideration when companies consider their usage. While there is a high degree of consistency in the regulation of executive options between Australia, the United States and the United Kingdom (Evans and Stromback, 1996), the use of ESO plans in Australia appears to be more variable than in these other countries. A possible reason for this is the degree of isolation of Australian companies from the global market for executives. This reasoning is based on the proposition that firms which are internationally diversified are forced to pay their senior executives an internationally competitive remuneration package. The use of stock options to remunerate the CEO is almost universal in the United States and the United Kingdom.<sup>4</sup> Because of the particular features and advantages of these options, they cannot easily be substituted with other forms of remuneration. Thus, the payment of stock options is essential to attract and retain chief executives.

A competitive labour market requires an internationally diversified firm to offer their CEO a compensation package which includes options and we therefore predict that Australian firms that are internationally diversified are more likely to have an ESO plan. However, Evans & Stromback (1996), using a sample of 73 firms, obtained conflicting results regarding this prediction. They found a statistically significant relation when international diversification was measured dichotomously but

<sup>4</sup> Rouse and Barton (1993) report that over 90 percent of publicly held United States corporations offer executive stock options. In the United Kingdom, Egginton, Forker and Grout (1993) found option plans in 97 percent and 85 percent of the largest 100 and smallest 100 U.K. listed firms respectively.

not when it was measured as a continuous variable. We therefore test for this relation using a larger and broader sample.

*H4: Internationally diversified firms are more likely to have an ESO plan than firms operating purely in the domestic market*

## 2.5. Size of the Firm

Firm size has been found to be the major determinant of remuneration paid to the CEO (Evans and Stromback, 1994; Izan, Kenny, Sidhu and Taylor, 1994). In order to ensure that firm size is not influencing results, we include firm size as a control variable in the models to be tested.

## 3. Research Method

### 3.1. Variable Specification

#### 3.1.1. Dependent Variable

The dependent variable in the model to be tested is dichotomous, based on the existence of an ESO plan. It is assigned a value of one if the company discloses in its annual report that it has an ESO plan and zero if there is no such disclosure<sup>5</sup>. It was not possible to obtain a more refined measure due to limitations in disclosure requirements at the time of the study.

#### 3.1.2. Independent Variables

##### 3.1.2.1. Remuneration of the CEO

Paragraph 12 of accounting standard AASB 1034: Information to be Disclosed in Financial Reports<sup>6</sup> deals with the disclosure requirements for executives' remuneration.<sup>7</sup> Section 12.1(b) requires disclosure of "the number of executive officers of the entity whose total remuneration for the financial year falls within each successive \$10,000 band, commencing at \$100,000". Remuneration is defined as any money, consideration or benefit earned in the ordinary course of work as an executive officer within Australia (section 12.3). Options issued with the exercise price equivalent to the share price at issue have no recorded value under present accounting methods. Paragraph four of AASB 1017 details similar disclosure requirements in relation to directors.

The compensation paid to the CEO<sup>8</sup> is measured as the mean of the disclosed remuneration band of the highest paid director. Alternatively, if the CEO is not also a director of the company<sup>9</sup>, the assumption is made that the executive with the highest disclosed remuneration is the CEO. This appears to be reasonable given that the CEO position is at the top of the hierarchy which determines the internal incentive structure.

##### 3.1.2.2. Investment Opportunity Set

The IOS is inherently unobservable and there is no general consensus regarding an appropriate proxy variable (Gaver and Gaver, 1995). Smith and Watts (1992) use the ratio of the book value of assets to firm value as their primary measure of the IOS, arguing that the higher the ratio, the greater proportion of assets in place. The book value of assets is used as a proxy for assets in place while the value of the firm comprises assets in place and growth opportunities. This proxy is limited, however, because firms vary in the way that they depreciate and revalue assets. Hence, the measure may not be fully reflective of the cross-sectional variation in the IOS. Smith and Watts (1992), however, perform sensitivity analysis using a number of other variables<sup>10</sup> and conclude that their results based on the primary variable are generally robust compared to alternate proxies of the IOS variable. Other re-

<sup>5</sup> The disclosure requirements imposed by AASB 1028, AASB 1017, AASB 1034 and section 308 of the *Corporations Law 1991* (Cth) allow determination of whether the firm has implemented an ESO plan.

<sup>6</sup> AASB 1034 was effective in replacing similar provisions which existed under Schedule 5 of the *Corporations Law 1991* (Cth).

<sup>7</sup> These requirements are equivalent to those of clause 29 of the superseded Schedule 5 of the *Corporations Law 1991*.

<sup>8</sup> The natural log of this variable is used for testing in order to normalize its distribution.

<sup>9</sup> Disclosed in either the directors' report or in the Related Parties information under AASB 1017.

<sup>10</sup> These include the ratio of depreciation to firm value, the ratio of research and development to firm value, the variance of the rate of return on the firm, the earnings/price ratio and the ratio of capital expenditures to firm value.

searchers to use this variable include Bizjak, Brickley and Coles (1993); Gaver and Gaver (1993), Kole (1994) and Gaver and Gaver (1995). A number of researchers have used the ratio of the market to book values of equity as a proxy for the IOS variable (Lewellen, Loderer and Martin, 1987; Collins and Kothari, 1989; Chung and Charoenwong, 1991). It is argued that this ratio represents the value of investment opportunities available to the firm (Gaver and Gaver, 1995).

Other measures of the IOS used in prior studies include the level of research and development expenditure (Clinch, 1991; Bizjak, Brickley and Coles, 1993; Skinner, 1993; Gaver and Gaver, 1993; Gaver and Gaver, 1995); variance of return (Gaver and Gaver, 1993; Gaver and Gaver, 1995); and earnings/price ratios (Chung and Charoenwong, 1991). Gaver and Gaver (1993) and (1995) calculate a factor score comprising a number of variables to measure the IOS. However, market to book value of assets and equity comprise the two dominant variables in their factor analysis.

The ratio of book value of assets to firm value and the book to market value of equity are used in this study because prior research has demonstrated that they appear to provide an adequate proxy for the IOS and the results generated are generally consistent with other variables used. These variables are labelled IOS1 and IOS2 respectively and are measured as follows:

$$\text{IOS1} = \frac{\text{Book Value of Total Assets}}{\text{Market Value of Common Equity} + \text{Book Value of Debt} + \text{Book Value of Preferred Shares}} \quad (1)$$

$$\text{IOS2} = \frac{\text{Book Value of Equity}}{\text{Market Value of Common Equity}} \quad (2)$$

### 3.1.2.3. Leverage

The proxy used to measure leverage is the proportion of firm value represented by debt (Smith and Watts, 1992; Anderson, Francis and Stokes, 1993). This is specified as follows:

$$\text{LEVERAGE} = \frac{\text{Book Value of Debt}}{\text{Market Value of Common Equity} + \text{Book Value of Debt} + \text{Preference Shares}} \quad (3)$$

The use of market values of debt would be preferable for this proxy, however the majority of debt on a company's balance sheet is not amenable to market value estimation.

### 3.1.2.4. International Diversification of the Firm

In order to test hypothesis four, the annual reports of the sample companies are examined to determine whether the company derived revenue outside Australia. From this, a continuous variable proxying for the international diversification of the firm was established. International diversification is measured as the percentage of Australian sourced revenues obtained by the firm. This information is a required disclosure under AASB 1005: Financial Reporting by Segments.<sup>11</sup> It is thus predicted that the lower the percentage of Australian derived revenues, the more likely it is that the firm has an ESO plan in place.

### 3.1.3. Control Variable - Firm Size

Several measures of firm size have been used in the literature. Some of the more frequently used proxies include sales revenue (Moses, 1987), net income (Wong, 1988), total assets (Hagerman and Zmijewski, 1979) and the market value of equity. While Hagerman and Zmijewski (1979) assert that no measure of size is superior to another, when considering firm specific characteristics, market capitalization is a more appropriate measure since assets and revenue may not adequately represent firms with high growth options. Market capitalization takes into account all factors, and hence is a less biased measure (McConnel, 1994).<sup>12</sup>

<sup>11</sup> AASB 1005 paragraphs 22, 23 and 24. A limitation of this data is that AASB 1005 only requires material geographical segments to be disclosed.

<sup>12</sup> The natural log of this variable is used for testing in order to normalize its distribution

### 3.2. Sample Selection and Data

The sample of firms is drawn from the largest 500 Australian firms by market capitalization.<sup>13</sup> The decision to sample from the top 500 companies reflects the availability of annual report data for these companies. After excluding unit trusts, investment funds, foreign firms and those with insufficient disclosure<sup>14</sup>, a final sample of 378 firms was generated. Of these, 225 firms were identified as having an ESO plan in place. This represents 59.5 percent of the final test sample. Table 1 displays the sample companies according to ASX industry classifications. The industry classifications of the sample firms approximate the distribution of all firms listed on the ASX.

A number of sources of data were used in addition to annual reports. These are *Personal Investment* magazine, *Shares* magazine and *The Australian Financial Review*.

### 3.4. Statistical Methodology

Recall that the hypotheses identify four firm specific characteristics which potentially have explanatory power in determining whether a firm uses an ESO plan. Descriptive statistics and Pearson product moment correlations are first calculated. Because the dependent variable is dichotomous, the hypotheses are then tested using logistical regression analysis. Firm size is included as a control variable.

**Table 1.** Examination of the sample according to ASX industry classifications

Category	ASX Classification Code	Percentage of all ASX listed firms <sup>15</sup>	Number of Firms in Sample	Percentage of Firms in Sample
Gold	011 – 016	21.9 %	52	13.8 %
Other Metals	021 – 028	9.4 %	27	7.1 %
Diversified Resources	031 – 036	0.5 %	3	0.8 %
Energy	041 – 047	5.7 %	28	7.4 %
Infrastructure and Utilities	051 – 055	1.5 %	5	1.3 %
Developers and Contractors	061 – 065	4.1 %	19	5.0 %
Building Materials	071 – 075	2.2 %	13	3.4 %
Alcohol and Tobacco	081 – 084	1.1 %	9	2.4 %
Food and Household	091 – 096	2.5 %	13	3.4 %
Chemicals	101 – 105	0.8 %	6	1.6 %
Engineering	111 – 115	3.2 %	9	2.4 %
Paper and Packaging	121 – 126	1.1 %	4	1.1 %
Retail	131 – 135	2.8 %	17	4.5 %
Transport	141 – 144	1.1 %	7	1.9 %
Media	151 – 155	2.6 %	19	5.0 %
Banking and Finance	161 – 162	1.5 %	15	4.0 %
Insurance	171 – 172	1.0 %	9	2.4 %
Telecommunications	181 – 184	2.0 %	7	1.9 %
Investment and Financial Services	191 – 196	9.6 %	19	5.0 %
Property Trusts	201 – 202	4.7 %	4	1.1 %
Health Care and Biotechnology	211 – 215	3.1 %	17	4.5 %
Miscellaneous Industrial	221 – 228	12.5 %	47	12.4 %
Diversified Industrials	231 – 235	2.2 %	14	3.7 %
Tourism and Leisure	241 – 243	2.9 %	15	4.0 %
	100 %	378	100 %	100 %

The regression model to be tested using logit analysis is:

$$\text{ESO PLAN} = \beta_0 + \beta_1 \text{CEOPAY} + \beta_2 \text{IOS} + \beta_3 \text{LEVERAGE} + \beta_4 \text{INTDIVERS} + \beta_5 \text{SIZE} + \varepsilon$$

Where IOS represents one of the two proxies for the IOS (IOS1 or IOS2).

## 4. Results

<sup>13</sup> Our study is a cross-sectional study using 1997 annual reports.

<sup>14</sup> Firms are not required to disclose executive remuneration less than \$100,000 p.a. (AASB 1034, Paragraph 12.1(b))

<sup>15</sup> Percentages obtained from The Australian Financial Review Shareholder: The Handbook of Australian Public Companies, 13th edition.

#### 4.1 Descriptive Statistics

Table 2 presents the descriptive statistics for the independent variables which are hypothesized as determinants of the firm's decision to utilize an ESO plan. Tests revealed that some variables were not normally distributed. In order to normalize their distribution, they were transformed prior to further statistical testing.<sup>16</sup> Statistics for skewness and kurtosis are reported in Table 2 after normalization. The average remuneration paid to the CEO across all sampled firms is \$580,912, with a range between \$85,000 and \$5,595,000. The natural log of this variable is used in order to ensure that extreme values do not unduly influence the results.

**Table 2.** Descriptive statistics for all independent variable specifications

Variable	Mean	Median	Standard Deviation	Skewness*	Kurtosis*
Remuneration of the CEO CEOPAY: mean of highest band of executive remuneration (transformed by using natural log)	580912	395000	641504	0.618	0.462
Investment Opportunity Set IOS1: ratio of the book value of total assets to the sum of the market value of equity and book value of debt	0.691	0.671	0.274	0.188	0.389
IOS2: ratio of the book value of equity to the market value of equity (transformed by using square root)	0.593	0.506	0.401	0.514	2.085
Leverage Ratio LEVERAGE: ratio of the book value of equity to the sum of the market value of equity and book value of debt	0.318	0.291	0.207	0.898	0.847
International Diversification INTDIVERS: percentage of Australian derived revenues	86.945	100.00	23.531	-2.152	4.115
Firm Size (\$000s) SIZE: market capitalization of the firm (transformed by using natural log)	1040000	169000	3320000	0.695	0.196

\* after transformation where applicable

When the IOS is calculated as the proportion of firm value attributable to assets (IOS1), a mean of 69 percent of firm value is represented by assets in place, whilst 31 percent is represented by growth options. The book value of equity represents a mean of 59 percent of the market capitalization of the firm (IOS2). The level of leverage in the sample firms amounts to a mean of 32 percent of firm value. Most firms in the sample derive their revenue from the domestic market, with the mean percentage of Australian derived revenue being 87%. The distribution of these variables is approximately normal with the exception of the ratio of book to market value of equity (IOS2). The distribution of this proxy is normalized by taking the square root of the raw data.

The control variable included in the model, firm size, also does not represent a normal distribution. The natural log of the market capitalization is used to normalize the distribution.

#### 4.2 Correlation Statistics

Table 3 provides the Pearson correlation coefficients of all the variables present in the logistic regression model. The correlation matrix identifies a number of significant correlations between the variables in the analysis. As expected, significant correlations exist between firm size and the other independent variables. The highly significant correlation between assets in place (IOS1) and the book to market value of equity ratio (IOS2) supports the contention that these variables are proxying for the same construct. Significant correlations are evident between the level of remuneration paid to the

<sup>16</sup> While not essential for logistical regression, normalizing the predictors may enhance power (Tabachnick and Fidell, 1996).



CEO and assets in place (IOS1), firm leverage and the proportion of revenue derived from within Australia. Finally, significant correlation is also apparent between firm leverage and both IOS variables. Diagnostic tests indicated that these correlations do not pose a serious problem for the logistic regression analysis.

The significantly positive correlation between the remuneration received by the CEO and the existence of an ESO plan is consistent with Hypothesis One, which predicts a significant relation between these variables without specifying the direction of that relation.

Hypothesis Two is based upon the concept of the firm's IOS, and predicts that there will be a negative relation between the proportion of firm value represented by assets in place and the utilization of an ESO plan. The IOS is proxied by two variables, the proportion of firm value represented by total assets (IOS1) and the ratio of book to market value of equity (IOS2). The correlation results are significant in the hypothesized direction for both of these IOS proxies and the existence of an ESO plan. These results are therefore consistent with Hypothesis Two.

The correlation between the level of firm leverage and the existence of an ESO plan is not statistically significant, which is inconsistent with Hypothesis Three.

The correlation analysis reveals a significant relationship between the internationalization of the firm, measured by the percentage of Australian sourced revenues, and the decision of the firm to utilize an ESO plan. The lower the proportion of revenues derived from the Australian market, and hence the higher the proportion of revenue sourced internationally, the more likely the firm is to have in place an ESO plan. This is consistent with Hypothesis Four.

**Table 3.** Pearson Correlation Matrix

	ESO PLAN	CEOPAY	IOS1	IOS2	LEVERAGE	INTDIVERS	SIZE
ESO PLAN	1.000						
CEOPAY	0.123** (0.016)	1.000					
IOS1	-0.094* (0.068)	0.150** (0.003)	1.000				
IOS2	-0.096* (0.063)	0.087* (0.092)	0.867*** (0.000)	1.000			
LEVER-AGE	-0.003 (0.957)	0.356*** (0.000)	0.543*** (0.000)	0.332*** (0.000)	1.000		
INT-DIVERS	-0.210*** (0.000)	-0.262*** (0.000)	0.000 (0.995)	0.002 (0.968)	-0.012 (0.820)	1.000	
SIZE	0.058 (0.260)	0.698*** (0.000)	-0.130* (0.012)	-0.158** (0.002)	0.158*** (0.002)	-0.187*** (0.000)	1.000

Correlation coefficient with p-values in brackets below

\* = significant at  $p < 0.10$  (2-tailed); \*\* significant at  $p < 0.05$  (2-tailed); \*\*\* = significant at  $p < 0.01$  (2-tailed)

ESO PLAN is the existence of an executive stock option plan; CEOPAY is the natural log of the mean of the disclosed CEO pay range for each firm; IOS1 is the ratio of the book value of total assets to the sum of the market value of equity and book value of debt; IOS2 is the ratio of the book value of equity to the market value of equity.

LEVERAGE is the ratio of the book value of debt to the sum of the market value of equity and the book value of debt; INTDIVERS is the percentage of Australian sourced revenue; SIZE is the natural log of the firm's market capitalization

#### 4.3 Logistic Regression Analysis

Two logistic regressions were estimated using the two alternative measures of the IOS. The regression coefficients retained the same signs and significance levels across the two model specifications and therefore only one regression, using IOS1, is reported in Table 4. The level of remuneration paid to the CEO is significantly positively related to the existence of an ESO plan, supporting Hypothesis One. The positive relation suggests that stock options are being used as a mechanism to increase total remuneration rather than as a replacement for other forms of remuneration. Both proxies for the IOS are significantly and inversely related to the existence of an ESO plan. It appears that the costs and benefits of monitoring and bonding managers, which vary between firms according to their investment opportunities, is a significant factor in determining whether a firm implements an ESO plan.

This result supports Hypothesis Two and is in contrast to the findings of Coulton and Taylor (2001), who found an unexpected negative association between growth and CEO options.<sup>17</sup>

Consistent with the univariate analysis, the logistic regressions indicate that firm leverage is not significantly related to the existence of an ESO plan. Hypothesis Three is not therefore supported. This finding supports that of McConnel (1994) who predicted and found that, after controlling for the effects of the firm's IOS, there was no direct relationship between firm leverage and the decision to implement an ESO plan.

**Table 4.** Logistical Regression Results using IOS1

$$\text{ESO PLAN} = \beta_0 + \beta_1\text{CEOPAY} + \beta_2\text{IOS1} + \beta_3\text{LEVERAGE} + \beta_4\text{INTDIVERS} + \beta_5\text{SIZE} + \varepsilon$$

Variable	Predicted Sign	Coefficient	Standard Error	Asymptotic t-value	Probability
CONSTANT		-0.162	2.372	0.005	0.946
CEOPAY	?	0.519	0.239	4.724	0.030 *
IOS1	-	-1.237	0.503	6.046	0.014 *
LEVERAGE	?	0.358	0.655	0.299	0.585
INTDIVERS	-	-0.021	0.006	11.610	0.0007 **
SIZE	Control	-0.184	0.107	2.948	0.086
% correct = 61.90 %					
Chi-Square : 28.28 (0.0000)					

\* = significant at  $p < 0.05$  (2-tailed); \*\* = significant at  $p < 0.01$  (2-tailed); CEOPAY is the natural log of the mean of the disclosed CEO pay range for each firm; IOS1 is the ratio of the book value of total assets to the sum of the market value of equity and book value of debt; LEVERAGE is the ratio of the book value of debt to the sum of the market value of equity and the book value of debt; INTDIVERS is the percentage of Australian sourced revenues

SIZE is the natural log of the firm's market capitalization

The extent to which the firm is internationally diversified is significantly and positively related to the existence of an ESO plan, providing support for Hypothesis Four. The results suggest that, the higher the proportion of revenues sourced internationally, the more likely that the firm utilizes an ESO plan in order to compete in the international market for executives.

The control variable, size, is not significantly related to the existence of an ESO plan. However, the significant correlations between this variable and the other variables in the model justify its inclusion. The results obtained from the logistical regression analysis are consistent with those obtained using univariate analysis. The reported Chi-Square statistics indicate that overall each model is significant ( $p < 0.001$ ) in explaining the variation in the utilization of ESO plans. When comparing predictions to the observed outcomes, each of the two regressions correctly predicts the existence of an ESO plan in approximately 62 percent of cases.

## 5. Conclusion

The objective of this study was to investigate the firm specific characteristics that provide ex ante incentives for firms to utilize an ESO plan as one of the components of the managerial remuneration package. We argued that the optimal managerial compensation contract serves to reduce agency costs, and hence the costs of contracting. Our results provide evidence of a positive relation between the level of remuneration received by the CEO and the existence of an ESO plan. We also found that a firm is more likely to utilize an ESO plan as the proportion of assets represented by growth options increases and as the degree of international diversification increases. However, there appears to be no relation between a firm's level of debt and its use of an ESO plan. Much of the prior Australian research in this area is descriptive in nature and has relied on survey data, due to the confidential nature of remuneration issues. Recent regulatory changes with respect to the disclosure of employee entitlements have permitted us to investigate a large sample, representing a more cross-sectional diverse range of firms. This substantially reduces the limited external validity which hampered much of the

<sup>17</sup> Because Coulton and Taylor (2002) use the inverse of the IOS formula, they predict a positive association but find a negative one.

prior research. The findings of our study have implications in areas such as corporate governance, managerial contracting, labour relations and decision making by shareholders and potential investors. The results provide insight into the incentives driving the remuneration strategies of Australian companies and are therefore useful to remuneration committees of companies when considering the design of efficient remuneration packages.

The study has a number of limitations. The use of a dichotomous dependent variable imposes limitations because it involves a loss of information. However, the regulatory environment at the time of the study prevented the calculation of a relative measure of option usage, such as the relative proportion of options in the total managerial remuneration package. Similarly, disclosures of executive remuneration at the time of the study allowed a focus only upon the remuneration of the CEO. Further, data such as market capitalization at balance date is highly dependent on the share price at that time. Finally, collection of accounting variables such as revenues, assets, liabilities and shareholders' equity is limited by the varying accounting policies of different firms in areas such as leasing, intangibles and revaluation of assets.

There are many opportunities for future research in this area, particularly in view of pending changes to the Australian regulatory environment with respect to disclosure of executive compensation.<sup>18</sup> Future studies can develop more refined models based on this additional disclosure, leading to a better understanding of the incentives which give rise to cross-sectional variation in compensation packages.

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<sup>18</sup> Australian accounting standards and the Australian Stock Exchange Listing Rules are currently being amended to require greater disclosure in this area.

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