

Does the Size and Holding Concentration of Executive Options Schemes Have  
Consequences for Firm Financial Performance?

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Abstract:

Executive options represent a phenomenon of particular economic significance. Just as their use has ballooned over the past decade, so too has the literature concerning their nature, cost and impact. However, despite the growth in the volume of literature devoted to the topic of executive options, there appears to be little agreement as to the performance impact brought about in consequence of the decision by firms to introduce executive options into their remuneration mixes. This paper contributes to the literature by providing evidence relating to the impact of options plans on firm financial performance. In particular, evidence is presented which suggests that option plan size (as measured by the portion of outstanding equity capital covered by options grants) and options holding concentration (the degree to which options granted under a plan are concentrated into the hands of the firm's most senior managers) have a significant impact on the manner in which executive options plans impact on firm financial performance.

Key Words:

Executive Options, Financial Performance, Holding Concentration

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## **1. Introduction**

Executive options form a material and often controversial element of executive remuneration. Their supporters proposed their adoption as a means of mitigating the types of agency failures which had exercised authors such as Jensen & Meckling (1976) and of resolving the consistent lack of meaningful relationship between executive pay and performance which had long featured within the relevant literature (e.g; Ciscel & Carroll 1980, Loomis 1982, Drucker 1984). Unfortunately, insufficient convincing evidence exists to demonstrate that executive options have fulfilled either of the above expectations. Therefore, the impact of executive options schemes on firms which adopt them remains a question amenable to further research.

This paper provides an overview of the outcome of a program of research aimed at unravelling the options performance riddle, and proceeds as follows. Section 2 provides background and context by exploring the extent to which options based remuneration grew in importance over the past two decades. Section 3 draws upon this context by reviewing relevant extant literature and demonstrating that despite the rise in use of options chronicled in section 2 of this paper, understanding of the options – performance relation remains elusive. Section 4 of the paper sets out details of the data employed drawn upon and the research methodology employed within this study, while Section 5 provides an overview of the results. Conclusions and policy implications are discussed in Section 6.

## 2. The Rise of Options

Executive options made the headlines during the later 1990s and early years of the new millennium and were the subject of considerable controversy (Carlin & Ford, 2005). However, the story of options as an element of executive compensation did not begin in the 1990s. Careful inspection of the historical record shows evidence of sporadic grants of options by large U.S based corporations during the 1920s and 1930s (Blasi et al, 2003). It was not until the 1950s however, that the use of options as an element of executive compensation became systematic and relatively widespread<sup>1</sup>. By 1952, approximately one third of companies listed on the New York Stock Exchange had granted options to their executives (Casey & Lasser 1953). Literature relating to executive options dating from the period suggests that a key driver of the decision on the part of U.S based corporations to grant options to employees was the objective of providing more tax efficient remuneration for executives. Whereas the top marginal rate of income taxation in the United States during the early 1950s was 91%<sup>2</sup>, the rate at which taxation was levied on capital gains was a comparatively modest 25%, and the U.S Supreme Court had ruled (apparently amidst considerable controversy) that gains accruing to executives as a consequence of exercising options were to be treated as capital, not income (Landman, 1953).

Despite considerable popularity during the 1950s and 1960s, the use of options as a device for remunerating executives dropped out of favour during the 1970s and remained unfashionable until the mid 1980s, around the same time that high profile

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<sup>1</sup> At least in the United States. Evidence relating to the history of the use of options in other jurisdictions is very limited.

<sup>2</sup> This is not a misprint.

financial economists such as Jensen and Murphy were arguing strenuously for the embrace of large scale equity linked compensation<sup>3</sup> (Delves, 2002).

So, in tracing the story of the rise of options as a phenomenon in executive compensation, it is not accurate to label executive options creatures born from the mid 1980s onwards. Equally however, available data demonstrates that the scale of options plans put in place by corporations during the 1990s (and beyond) was massive in comparison to the scale of options plans used prior to that point. The explosion in options schemes which took place during the 1990s can be measured on three key dimensions. The first of these is the frequency with which organisations granted options to their executives. It has been estimated that in 1980, only 30% of U.S. Fortune 500 CEOs received options as part of their package (Hall & Liebman, 1998), while by 1999, 98% of U.S. Fortune 500 CEOs received options as part of their package (Hall & Murphy, 2002). Similar growth patterns have been noted in jurisdictions other than the U.S, for example the United Kingdom (Pass, 2003) and Australia (Carlin & Ford, 2005). Thus it appears clear from the empirical record that more organizations have adopted options plans as an element of executive remuneration over time.

The second dimension on which the growth in the size of options plans may be measured is the volume of options granted pursuant to executive options schemes. Here the changes over time are also striking. It has been estimated that the mean percentage of stock options outstanding as a proportion of outstanding ordinary equity

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<sup>3</sup> That equity markets were performing far more strongly from the early 1980s onwards when compared to the stagnation of equity prices during the 1970s was no doubt also influential in stimulating interest in the return to the use of options.

shares for U.S Based general industrial companies ranged between 3 – 5% with extremes of 8 – 10% in 1990. By 2001, this had grown to a mean scheme in the range of 12 – 15% of outstanding ordinary equity capital with extremes in the range of 20 – 25% (Delves, 2004). A similar pattern (albeit with lower mean option scheme size values) has been reported in Australia (Carlin & Ford, 2005). Part of the observed growth may be explained by an increasing tendency towards the phenomenon of options “mega grants”, defined as events where options with a value of a multiple of more than ten times the annual salary and bonus of an executive are granted in one hit (Pearl Meyer & Partners, 2003)<sup>4</sup>.

The third dimension on which the growth in the size of options plans may be measured is in terms of their value. Here the available data is also striking. On one published estimate, US Fortune 500 CEO income rose from a multiple of 48 times average process worker salary in 1990 to approximately 460 times average process worker salary in 2000 (Harvard, 2002). By 2003 the multiple had grown to approximately 500 times average worker salary (Revell, 2003). Much of this increase can be attributed to the increasing proportion of executive earnings attributable to one source in particular, options. Other measures of value also demonstrate the enormity of the growth in importance in executive options as a component of remuneration<sup>5</sup> from the early 1990s onwards. It has been estimated for example, that in 1992, the top 5 executives of the largest 1,500 U.S corporations exercised options with a total value

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<sup>4</sup> There have been documented instances where mega grants have resulted in options to the value of more than US \$100 million being granted to individual executives at one point in time. Notable individual recipients of very large individual options grants of this nature include Tony O’Reilly of Heinz, Roberto Goizueta of Coca-Cola and Michael Eisner of Disney.

<sup>5</sup> In both absolute and relative terms.

of US \$ 2.4 Billion. By 2000, the value of options exercised by this group had grown to US \$ 18 Billion (Blasi et al, 2003, p. 73).

Whether it is posited that the enormous documented growth in options was stimulated by lax accounting rules, allowing corporations to treat grants as though they represented an effectively free event (Carlin & Ford, 2003), favourable taxation treatment (Thatcher, 2004), power imbalances between boards of directors and senior executives (Bebchuk & Fried, 2004), the desire to better align management and shareholder incentives (Jensen & Murphy, 2004) or any one of a host of other potential rationales, what cannot be debated is the enormous growth in the economic significance of the executive options phenomenon from the early 1990s onwards. Despite this, as demonstrated in Section 3 below, the literature on the impact of executive options schemes remains fractured and riven with contradictions. Given the reliance often placed on executive options schemes by modern corporations, this is both surprising and troubling.

### **3. Overview of Relevant Literature**

The discussion above advanced the view that widespread use of options based compensation is a significant economic phenomenon. Though much of the evidence to support this proposition is sourced from the United States, the options phenomenon has by no means been limited to the United States (Johnston, 1998; Coulton & Taylor, 2002). Commercial practice in Australia, among other countries, has followed the US equity-based compensation practice with large options grants becoming common over the last decade (Clyne, 2000).

Given the magnitude of the executive options phenomenon, it is hardly surprising that a significant body of research literature devoted to the subject has now accumulated. Rather than unanimously supporting the ex ante expectation that the use of executive options would confer unambiguous benefits on issuing companies and their shareholders alike, a growing volume of research is raising troubling questions about the impact of options in real commercial situations. Given the volume of this literature, comprehensive coverage of the results reported to date is not feasible in the context of this work. However, an overview of some of the more notable contributions will provide a sense of the types of difficulties now being encountered.

First, questions have been raised about the impact of options schemes on the nature and timing of information flows between corporations and capital markets. In their work on this subject, Aboody and Kasnick (2000) examine whether voluntary disclosures by corporations take on a different character at different points of the option scheme cycle – for example grant dates and vesting dates. Their findings indicate that corporations make opportunistic voluntary disclosures decisions designed to maximise the value of their share option compensation. Aboody and Kasnick argue that their data lends support to the notion that corporations appear to have a greater tendency to strategically release bad news (which may depress share price and thus contracted exercise price) in the period leading up to grant dates for options. They also find a greater tendency for good news releases which may increase share prices and thus option holder wealth prior to vesting dates. This timing of disclosures to capital markets provides top management the opportunity to expropriate higher remuneration from the company without necessarily adding value to existing shareholders. The Aboody and Kasnick findings are grave since they suggest that

many managers may have been engaging in subtle forms of market manipulation in order to improve their wealth positions.

The assumption that the employment of executive options will as a matter of course serve to align the interests of recipient executives and shareholders has also been subjected to pressure by recent literature relating to capital structure decisions and their apparent association with executive option plans. Recent evidence suggests that firms that rely more on option-based compensation have a materially greater propensity to repurchase shares than firms that do not rely heavily on option schemes (Joll 1998, Yermack 2001). In these studies, the factor which most acutely explained cross sectional variation in buy-back behavior related to the existence of executive options schemes, yet it is not at all clear why the presence of an option scheme would render a share buyback arrangement a more attractive value creation exercise for the shareholders as a whole.<sup>6</sup>

Consequently, some authors have argued that the association might be explained by reference to manager opportunism. That is, buyback schemes being configured and timed to drive share prices upwards at times most likely to enhance option holder value (for example at vesting dates) but not necessarily producing enduring value for other shareholders (Carlin & Ford, 2004). A further example of opportunistic behaviour relates to dividend policy choices, also ultimately influential in determining firm capital structure. Several studies have found evidence that executives holding

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<sup>6</sup> One motivation for share buybacks put forward by some companies is to limit the dilution effect when options issued to employees are exercised. That is, while issuing shares at exercise dilutes earnings per share (EPS), this can be offset by repurchasing shares in the market. It is worth noting that a value transfer from shareholders to employees occurs to the extent that the exercise price on the options is below the market price at which the shares are repurchased, which would be expected if the timing of the buyback is close to the exercise of options. This motivation also needs to be questioned within the context of the opportunity cost of the funds used for the buyback.

options are more likely to reduce cash dividends (for example, Lambert, Lanen and Larcker, 1989). The finding should not be surprising given dividends have the effect of reducing share price and thus the value of options. Aboody and Kasnick (2001) lend support to this finding - executives with large holding of stock options prefer share buybacks rather than the distribution of cash to shareholders via dividends.

While proponents of equity based compensation have argued that a vital element of the incentive alignment process achieved via the use of executive options is the achievement of a state of affairs whereby option recipients come to own larger and larger proportions of the outstanding equity base of the organizations for which they work, empirical evidence on this question has demonstrated that this may not be occurring in practice. A small mountain of empirical evidence gathered in the United States suggests that there is a strong tendency for managers to sell shares that they already own in the company so as to reduce the risk exposure created by the new issue of options. Moreover, the findings of Ofek and Yermack (1999) indicate that executives tend to cash out nearly all stock acquired after exercising options. This type of evidence raises further questions as to whether the adoption of options plans is effectively resolving the principal-agent conflicts.

The suspicion that the incentive sets of shareholders and executives holding options has only been heightened by literature suggesting the extensive use of private (and often undisclosed) hedging strategies by executives who can effectively limit or remove the risk of their options by engaging in such arrangements (Ellis,1998). The existence of this type of activity has been documented in a number of jurisdictions, including Australia (Ali & Stapledon, 2000)

Criticisms have also been raised in relation to the actions taken by corporations in setting the exercise prices of options issued pursuant to their executive option schemes. One particularly controversial activity noted within the literature on executive options is the practice known as reloading<sup>7</sup>. This describes a state of affairs where the strike prices of options are adjusted downwards at some point after grant date or where maturities of options are extended to prevent them from expiring worthless<sup>8</sup> (Harper, 2002). This type of activity delivers windfall gains to option holders, but at the same time has been demonstrated to have a negative overall impact on shareholder value (Brenner et al, 2000) – a result difficult to reconcile with the image of executive options as tools for mitigating agency problems.

Further, a growing body of literature notes the consistent tendency of corporations to issue options at the money while it has been theorized and demonstrated empirically that out of the money grants represent a superior means of resolving the incentive alignment problem between executives and shareholders (Bebchuk & Fried, 2004; Rosser & Canil, 2004). The high degree of use of fixed exercise options rather than indexed options which strip out the effects of general rises in equity valuations (and thus avoid delivering windfall gains not related to firm specific performance) has also been viewed as problematic (Fox, 2001).

In addition to the types of problems identified above, it has been argued that share options schemes may induce excessive or inappropriately targeted risk taking. Managers may have greater propensity to gamble the firm's assets, which results in

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<sup>7</sup> This is also referred to as “resetting” by some authors.

<sup>8</sup> Both may occur simultaneously.

increasing the volatility of the stock price and thus the value of their options. Chen (2002) examines the impact of stock options on the risk profile of projects undertaken by firms. The findings indicate that companies that have executive options plans demonstrate greater volatility in investment returns compared to those who do not. This result has also been reported in other related literature (Defusco et al, 1990).

The literature discussed above suggests that the story of executive options as devices for resolving agency conflicts is neither clear cut nor simple. It would appear that while options have delivered significant wealth transfers to those in receipt of them, it is not possible to be as confident about the extent to which they have resolved the types of agency conflicts which in theory motivated their employment as an element of executive remuneration (Campbell & Wasley, 1999). On the available evidence, options may be associated with suboptimal risk choices and with a range of actions whose ultimate impact is to expropriate wealth from the shareholders as a whole of the corporations which elected to grant options as part of their remuneration strategy.

However, a question of potentially greater importance from the point of view of assessing the worth of options as remunerative devices is the issue of the impact of options schemes on firm performance. Even if options can be demonstrated to drive wealth expropriating behavior, shareholders might still be better off in the presence of options if the incremental value generated in consequence of the employment of options exceeds the value of wealth expropriated<sup>9</sup> as a result of perverse incentives stimulated by the grant of options. Of course, providing a definitive answer to a question so fraught with uncertainty is an extremely difficult, if not impossible task.

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<sup>9</sup> If indeed expropriation is taking place.

Less challenging however, is the more straightforward question of the extent to which the adoption of executive option schemes by businesses is in fact associated with firm performance. Arguably, in light of the above, demonstration of a positive association between the existence of options schemes and firm performance represents a necessary though not sufficient condition to demonstrating the value enhancing consequences of options schemes to shareholders as a whole.

Unfortunately, the literature which addresses the question of the association between executive options plans and firm performance is fractured and in many cases, contradictory. In their seminal study based on U.S data, Jensen and Murphy (1990) were able to find only a weak association between executive remuneration (including equity linked sources such as options) and overall firm performance, though they still recommended<sup>10</sup> the use of options as a device for increasing the sensitivity of executive remuneration to changes in firm value and total shareholder wealth.

Other published studies have been bolder in their claims. Mehran (1995), using U.S based data, found that firm performance was positively related to the structure of executive remuneration and particularly by the degree to which compensation was equity based. Similar results have been claimed by researchers examining data pertaining to U.K based firms using data from both the 1980s and 1990s (Main et al, 1996; McKnight & Tomkins, 1999).

However, just as the authors of the studies cited above have exhibited at least mild confidence that a positive association between options based remuneration and firm

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<sup>10</sup> And have continued to recommend in subsequent writings on the subject – see for example; Jensen & Murphy 2004.

performance exists, a range of other studies have been published where different conclusions have been drawn. In some cases, it has been concluded that no significant association can be drawn between options schemes and firm performance (e.g; Leonard,1990; Conyon & Gregg, 1994; Elyan et al 2001; Gao & Shrieves, 2002, Coulton & Taylor, 2002; Pass, 2003). In others, researchers have concluded that the existence of equity linked compensation schemes such as options might actually be associated with shareholder value destruction (Campbell & Wasley, 1999; Bebchuk & Fried, 2004).

The studies which show a lack of association between options schemes and corporate performance have been based on data from a number of jurisdictions including the United States (e.g Leonard 1990), the United Kingdom (e.g Pass, 2003), New Zealand (e.g Elayan et al 2001) and Australia (e.g Coulton & Taylor, 2002). Further, just as the data from which those studies in which it was concluded that some positive association between options schemes and firm performance could be discerned was drawn from a number of distinct chronological periods, the same can be said of those papers where no association is able to be demonstrated. This suggests that the results reported within the extant literature are not the product of mere idiosyncratic differences of timing or institutionalized differences between jurisdictions.

#### **4. Data and Research Methodology**

The essential argument embedded in the review of the literature set out above is that there is insufficient clarity in relation to the question of the impact of executive options schemes on a number of key factors issues, including corporate financial performance. This is the subject of this study. The data used for the purposes of the

research covered a beginning sampling frame of 100 large Australian listed corporations over a timeframe spanning 1997 through 2004 inclusive. These covered approximately 75% of the total market capitalisation of the Australian stock exchange at the commencement of the period reviewed.

Not all of these 100 companies had options plans in every year between 1997 and 2004, and not all organisations included within the sampling frame survived for the entire period under examination. A total of 21 organisations had been delisted by the conclusion of 2004 meaning that data pertaining to these organisations was no longer available for examination from the point of exit onwards<sup>11</sup>. Overall, a total of 572 firm – year observations was available for study. However, 65 of these observations related to financial institutions, and because of the special characteristics of these organisations it was decided to exclude them from the dataset used for the purposes of analysis. Consequently, the number of firm – year observations ultimately used for analytical purposes totalled 507. A summary of the testing sample is provided in Table 1.

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<sup>11</sup> For a detailed overview of the constituent organisations which made up the sampling frame, see Appendix A. For a detailed overview of the observations gathered on a company by company basis for the purposes of this study, see Appendix B.

**Table 1 Summary of the Testing Sample**

period for performance and risk data	period for options % and concentration data	Period for control variables data	sample size per year-ex*	sample size per year-in <sup>#</sup>
1997	1997	1997	59	64
1998	1998	1998	64	72
1999	1999	1999	64	73
2000	2000	2000	68	77
2001	2001	2001	68	77
2002	2002	2002	69	78
2003	2003	2003	60	68
2004	2004	2004	55	63
Testing sample size -			507	572

\* = excluding financial institutions, # = including financial institutions

The focal question examined in this paper is the relationship between executive options plans and firm performance. Ideally, research undertaken with a view to providing insight into this issue would be conducted on a with – without basis. That is, the properties of firms in all respect identical to other firms but for the existence (or absence) of an executive options scheme would be compared, allowing inferences to be drawn about the impact of the one variable differing between them – the options plan. This type of approach to research is normally facilitated via the use of a matched pairs design.

However, the use of such an approach was not possible in the case of this research, largely because of the high degree of concentration of the Australian stock exchange and the relatively small population of listed entities. Even expanding the sampling frame significantly would not have yielded a sufficiently large with – without options

plan dataset matched on key dimensions such as size, industry and age to be useful for robust statistical testing.

Consequently, the tests conducted for the purposes of this study are based on a group of firm-year observations pertaining to organisations which did have executive options. This weakens the potential to gather insights into the absolute performance impact of executive option schemes. On the other hand, it facilitates research into the possible performance impact of the size of options schemes configured by organisations in a bid to resolve agency problems and drive performance increases.

A further phenomenon of interest is the so called options holding concentration, which measures the degree of dispersal of options grants pursuant to a corporation's executive options plan. A plan characterised by low dispersal is one in which a material portion of the options granted pursuant to a plan are concentrated into the hands of a small number of senior executives. It has been speculated that this may have a modifying effect on the impact of executive options schemes (Carlin & Ford, 2004), and so data pertaining to holdings concentration is also incorporated into the testing regime adopted for the purposes of this research.

To examine the association between company performance and the size of options scheme and holdings concentration, three regression models were estimated, being:

$$\text{Model 1: } ROA_{i,t} = \alpha + \beta_1 \text{Options\%}_{i,t} + \beta_2 \text{LnSIZE}_{i,t} + \beta_3 \text{BizRISK}_{i,t} + \beta_4 \text{LEV}_{i,t} + \beta_5 \text{ConDum}_{i,t} \\ + \beta_6 \text{IndDum1} + \beta_7 \text{IndDum2} + \beta_8 \text{IndDum3} + \beta_9 \text{IndDum4} + \varepsilon$$

$$\text{Model 2: } ROE_{i,t} = \alpha + \beta_1 \text{Options\%}_{i,t} + \beta_2 \text{LnSIZE}_{i,t} + \beta_3 \text{BizRISK}_{i,t} + \beta_4 \text{LEV}_{i,t} + \beta_5 \text{ConDum}_{i,t} \\ + \beta_6 \text{IndDum1} + \beta_7 \text{IndDum2} + \beta_8 \text{IndDum3} + \beta_9 \text{IndDum4} + \varepsilon$$

$$\text{Model 3: } \text{TbQ}_{i,t} = \alpha + \beta_1 \text{Options\%}_{i,t} + \beta_2 \text{LnSIZE}_{i,t} + \beta_3 \text{BizRISK}_{i,t} + \beta_4 \text{LEV}_{i,t} + \beta_5 \text{ConDum}_{i,t} \\ + \beta_6 \text{IndDum1} + \beta_7 \text{IndDum2} + \beta_8 \text{IndDum3} + \beta_9 \text{IndDum4} + \varepsilon$$

Where:

$i,t$ : company  $i$  at time  $t$

ROA = ratio of net income to total assets

ROE = ratio of net income to total equity

TbQ = ratio of market value of share capital to book value of total assets. The market value of shares is measured by multiplying the number of shares by the share price at the end of the year.

Options% = size of options schemes: the number of total options as a percentage of total shares outstanding at the end of the year.

LnSIZE = company size: natural logarithm of the company's total assets.

BizRISK = business risk: standard deviation of net income.

OptConc = Options holding concentration – the portion of outstanding options in the hands of the board of directors.

IndDum1=Industry dummy: 1 for manufacturing and production companies and 0 otherwise.

IndDum2 = Industry dummy: 1 for retailing and distribution companies and 0 otherwise.

IndDum3 = Industry dummy: 1 for mining companies and 0 otherwise.

IndDum4 = Industry dummy: 1 for financial companies and 0 otherwise.

Pooled regression was used to maximise the number of observations available for analysis. Accordingly, data on each dependent variable (proxy) were regressed on data in relation to the independent variables and control variables collected from the same year.

In configuring tests of the options scheme – performance relationship, the dependent variable, company performance, was measured using three proxies: return on assets (ROA), return on equity (ROE) and Tobin's q (TBQ). The first two measures (ROA and ROE) may be characterised as having the character of accounting based measures while Tobin's q incorporates a market based component. The use of this portfolio based approach to measurement can therefore be seen as an attempt to mitigate the risk that idiosyncratic factors specific to one particular measurement frame might distort the results without a meaningful chance that this might be detected and taken account of during the process of data interpretation.

Return on Assets (ROA) is measured as the ratio of net (accounting) income to total assets. Net income is defined as net profit after tax and abnormal item if applicable. This accounting measure is commonly included by extant literature when examining corporate performance (Stutley, 2003). It provides useful insights because it captures information pertaining to two key drivers of value generation, first profit margins and second, asset turnover, both of which combine to influence overall value generation.

A closely related measure is Return on Equity (ROE), which is measured by the ratio of net income to total equity. Again, this measure is widely recognised and employed as a measure of corporate financial performance (Walsh, 1996). Return on equity

captures the impact of profit margin, asset turnover and financial leverage. In some senses it represents a narrower measure of performance and value generation than return on assets, since it captures returns earned on shareholders funds only, not the entire asset base of the organisation. However, this seems an appropriate approach to capturing performance in the context of a study of instruments whose theorised purpose is to align the interests of their recipients with those of shareholders generally.

A third proxy for performance employed within this study is Tobin's q, which is measured as the ratio of market value of share capital to book value of total assets<sup>12</sup>. The market value of shares is calculated by multiplying the number of shares outstanding by the share price at the end of the year. Tobin's q has been widely embraced as a market-based measure of company performance in previous literature (Lindberg & Ross, 1981).

The size of options schemes was measured by calculating the number of outstanding options as a proportion of the outstanding ordinary shares on issue by each company for each year in which that company figured in the research sample. Options holding concentration was measured as the proportion of options outstanding held by members of the board of directors. This variable was included as a phenomenon of interest on the basis of earlier work in which it was argued that options holding concentration had been overlooked as a potentially important factor in understanding

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<sup>12</sup> Technically, the ratio represents the ratio of the market value of equity to the replacement value of total firm assets. However, because of the difficulties associated with estimation of the replacement value of firm asset bases, it is common to resort to the use of the book value of assets rather than the replacement value of assets when estimating Tobin's q. This may have the consequence of introducing noise and bias into the measure.

the impact of executive options schemes in practice (Carlin & Ford, 2004). Variables to control for industry, size and business risk were also included in the regression models specified for the purposes of the research.

## **5. Results**

Descriptive statistics in relation to the dependent variables and key independent and control variables are set out in Table 2, below, while Table 3 provides details of the results of the regression models specified for the purposes of the research.

Table 3 shows that ROA is negatively correlated with the size of executive options schemes “options%” at the 5% significance level, indicating that the larger the size of options schemes the lower the ROA in companies. ROE is also negatively correlated with options% at the 10% significance level. ROE shows significant positive correlation with options holdings concentration at the 5% level<sup>13</sup>. The observation that accounting performance measures are negatively correlated with the size of options schemes but positively correlated with concentration has potential implications with respect to the incentive effects of options schemes. These are discussed further below.

If performance is measured in terms of Tobin’s q (TBQ), no significant association is detected with the size of options schemes. However, with respect to options concentration, TBQ is negatively correlated with holding concentration at the 1% significance level. This runs contradictory to the positive relationship observed between option holdings concentration and ROE<sup>14</sup>.

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<sup>13</sup> The sign of the coefficient of options holding concentration in the ROA performance model is also positive.

<sup>14</sup> And also ROA based on the sign of the relevant coefficient.

**Table 2 Descriptive Statistics of Variables – Excluding financial institutions data**

	<b>N</b>	<b>Median</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<i>S.D</i>
<b>Corporate Performance Variables</b>						
ROA (%)	507	5.016	3.7	-157.488	83.798	14.496
ROE (%)	507	10.5	3.24	-976.37	222.33	79.33
TBQ	507	0.9541	1.3947	0.0272	15.7203	1.5654
<b>Independent and Control Variables</b>						
Options%	507	2.1952	2.525	0.0087	11.2474	1.8025
SIZE(in AUD\$m)	507	1,158	3,561	4	84,961	8,972
BizRISK(stdev)	507	50.8	194	1.4	4701.1	613.1

**Variable definitions**

ROA = ratio of net income to total assets

ROE = ratio of net income to total equity

TBQ = ratio of market value of share capital to book value of total assets. The market value of shares is measured by multiplying the number of shares by the share price at the end of the year.

Options% = size of options schemes: the number of total options as a percentage of total shares outstanding at the end of the year.

LnSIZE = company size: natural logarithm of the company's total assets.

BizRISK = business risk: standard deviation of net income.

**Table 3 Multiple Regression Results for Performance (Ex)**

	<b>ROA</b>	<b>ROE</b>	<b>TBQ</b>
<b>Constant</b>	0.02277 (0.54)	0.06310 (0.31)	4.19290 (9.89)
<b>Options%</b>	-0.77110 (-1.96)**	-3.29500 (-1.72)*	2.20500 (0.56)
<b>CompSize</b>	0.00759 (1.52)	0.02804 (1.16)	-0.29179 (-5.83)***
<b>BizRisk</b>	-0.00002 (-1.47)	-0.00005 (-0.86)	0.00012 (0.99)
<b>Lev</b>	-0.00346 (-1.76)*	-0.11578 (-12.17)***	-0.03757 (-1.91)**
<b>OptConc</b>	0.02094 (1.62)	0.12648 (2.02)**	-0.59060 (-4.54)***
<b>Ind1D(manuf)</b>	-0.04974 (-3.11)**	-0.18853 (-2.43)**	-0.82730 (-5.16)***
<b>Ind2D(Retail)</b>	-0.01917 (-0.91)	-0.07720 (-0.76)	-0.64450 (-3.07)**
<b>Ind3D(Mining)</b>	-0.02669 (-1.40)	-0.03465 (-0.38)	-0.84150 (-4.42)***
<b>Ind4D(Fin)</b>	-0.01365 (-0.48)	-0.39600 (-2.87)**	-0.67290 (-2.35)**
<b>R-sq</b>	4.40%	25.2%	17.60%
<b>R-sq(adj)</b>	2.60%	23.90%	16.20%
<b>F</b>	2.53	18.65	11.83
<b>p-value</b>	0.008	0	0
<b>observations</b>	507	507	507

We posit that the results relating to the relationship between the size of options schemes, options holding concentration and the observed level of accounting based measures of performance such as ROA and ROE are capable of being understood along the following lines. First, the result relating to concentration suggests that better

value is derived from options plans when options are granted to a relatively small group of individuals who have the most direct capacity to influence overall firm value generation. This suggests that, at least in the context of established firms<sup>15</sup> such as those included in our sample, there is little virtue in extending grants of options below the most senior rung of management. Indeed, extending the use of options too far throughout the organisation may be harmful to the firm's performance prospects – a possibility indicated by the persistently negative association between option plan size and accounting based measures of financial performance.

Agency theory predicts that the recipients of options will have their interests aligned with those of shareholders and consequently strive harder to generate shareholder value. Under the right conditions, this effect may indeed be achieved, even where an individual recipient of options is at best remote from the shareholder value generation interface. But many factors may intervene to produce a less than optimal outcome. Indeed, in contemplating the impact of executive options it is important to remember that the fact of having been granted options does not obviate the need, on the part of the recipient, to conform to the demands of other performance measurement and management systems which exist within the firm. These are the systems most likely to dominate choices and behaviours in the short term, yet it has been widely argued that these systems are endemic and often result in significant value destruction (e.g; Jensen 2003). On the other hand, the payoff associated with options comes only in the

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<sup>15</sup> The position in startups and cash poor organisations may differ substantially. For example, the practice of using substantial quantities of options and distributing these widely throughout the entire workforce of an organisation is well documented in the information technology and biotechnology industries (Blasi et al, 2003). Although all of the usual precepts of agency theory may be used to explain the use of options in these settings, an additional highly pragmatic consideration not shared with larger, better established firms comes into play in these settings. Often, fledgling organisations in these industries simply do not have the required cash resources to pay market rates to the human capital factors they require to put their business plans into action. Consequently, options are used as a cash alternative. This explanation for options does not hold true in established organisations.

medium to long term and cannot in most cases be meaningfully linked with the actions of an individual employee (Frey & Osterloh, 2005).

Thus an analysis of the impact of executive options must take into account the fact that they represent just one layer of a complex and potentially contradictory incentive environment. Indeed, we posit that the strongest incentive generated in the short to medium term in consequence of the receipt of options relates not to shareholder value generation, but to the continuation of employment. This supposition is in accordance with extant empirical evidence demonstrating that executive options plans are associated with decreasing employee turnover rates (Carter & Lynch, 2004).

Thus we explain the observed negative association between options plan size and performance measures such as ROA and ROE in the following terms. Higher plan size likely means a greater number of options recipients. Yet the interface between shareholder value creation and individual effort is at best weak and diminishes rapidly as the level of seniority of the options recipient falls. Nonetheless, recipients perceive options grants as being potentially individually valuable to them if they are able to sustain the tenure of their employment to vesting date. The most certain means of achieving this is to deliver that which is rendered visible and valuable by the firm's performance management system, even where this can be demonstrated to result in overall value destruction. Thus growth in the number of options recipients may amplify any value destructive tendencies already inherent to an organisation as a result of poor incentive scheme design, explaining the poorer observed performance of firms with larger options schemes relative to those with smaller schemes (and less perverse incentive amplification).

On this approach, it is not difficult to reconcile the observed positive relationship between options holding concentration and firm performance with the observed negative relation between options plan size and firm performance. In a real sense, these results represent the flip side of the same coin. Higher options holding concentration means less dispersal of options into hands far removed from the shareholder value interface and less perverse incentive amplification.

Recall that our results also suggested a negative relationship between Tobin's  $q$  and options holding concentration. For the purposes of this study, Tobin's  $Q$  is measured as the market value of equity over the book value of assets. If concentration of options in the hands of senior executives encourages these individuals to embark on high growth strategies, such as corporate acquisitions<sup>16</sup>, then it is not unreasonable to expect Tobin's  $Q$  to be negatively associated with options concentration given that such strategies would have an immediate impact on the book value of assets – the denominator – without necessarily resulting in corresponding increase in the market value of the firm.<sup>17</sup> This arises, in part, because the Tobin's  $Q$  measure fuses market based measures of performance with accounting measures of the firm. With respect to the latter, the assets of the acquiring entity increase by an amount equal to the market value of the acquired entity at the time of purchase. However, in terms of the share market reaction to the transaction, the outcome is less specific. The share market may be positive about the acquisition, in which case the market value of the firm rises, but

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<sup>16</sup> Although we do not report it here, since the focus of this paper is on the relationship between options schemes and measures of firm performance, we also tested the impact of option size and holdings concentration on a range of other variables, including asset growth rate, which we found to be positively associated with options holding concentration at the 5% level.

<sup>17</sup> The focus on high growth strategies would be motivated by a positive association between managerial compensation, including perquisites, and firm size. This has been observed by Lambert, Larker and Weigelt (1991).

the Tobin's Q measure does not rise due to the relatively diffused impact of the share market response relative to the one-off impact on the balance sheet of the acquiring company. Alternatively, the share market may view the acquisition as neutral or value destroying, in which case the Tobin's Q measure would decline. In either scenario, the Tobin's Q measure could be expected to be negatively associated with options concentration.

## **6. Conclusion**

The results of this research have significant policy implications. In particular, the results demonstrate that in the context of overseeing executive remuneration policy, boards should be aware that the extension of options schemes too far through an organisation may serve to amplify value sapping tendencies inherent in the design of their organisations' incentive and accountability systems, yielding poor performance relative to competitors whose use of options is more parsimonious.

While the results do not support a conclusion that the existence of options plans per se may have harmful consequences for firm financial performance, they do serve as a reminder that plan design is a matter which if not handled with particular care can result in unforeseen negative consequences – in the case of our research, in lower financial performance relative to organisations with smaller options plans.

While we believe that the results are policy useful in their present state, they do point to a number of questions for future research and clarification, for example the matter of whether there exists an optimal size / spread combination for executive options plans, and the nature of the interaction effects between the incentive effects generated

by executive options plans versus those present in the context of pre-existing organisational incentive and accountability structures. Further resolution of these questions should lead to an improved capacity to design options schemes which harness executive options for the purposes for which they were intended, rather than allowing them to let slip the dogs of uncertainty and value destruction.

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## Appendix A The Sampling Frame

Code	Company name	Code	Company name
ABC	ADELAIDE BRIGHTON	NAB	NATIONAL AUST. BANK
ADB	ADELAIDE BANK	NCM	NEWCREST MINING
AGL	AUSTRALIAN GAS LIGHT	NCP	NEWS CORPORATION
AMC	AMCOR LIMITED	NDY	NRMANDY MINING
AMP	AMP LIMITED	NFD	NATIONAL FOODS LTD
ANL	ANACONDA NICKEL	NVS	NAVUS PETROLEUM
ANZ	AUSTRALIA & NZ BANK	OEC	ORBITAL ENGINE CORP
APN	APN NEWS & MEDIA	OPS	OPSM GROUP LIMITED
BHP	BHP BILLITON LIMITED	OSH	OIL SEARCH LTD
BIL	BRAMBLES INDUSTRIES	PBL	PUBLISHING & BROAD
BOQ	BANK OF QUEENSLAND	PDP	PACIFIC DUNLOP
BKL	BLACKMORES	PHY	POLARTECHNICS
BPC	BURNS PHILP	PLM	PETALUMA
BRL	BRL HARDY LIMITED	PLT	POLARTECHNICS
BWA	BANK OF WESTERN AUST	PMM	PORTMAN LIMITED
CAA	CAPRAL ALUMINUM	PPT	PERP TRUSTEES AUST
CBA	COMMONWEALTH BANK	PTD	PEPTECH LIMITED
CEP	CENTRO PROPERTIES	QAN	AANTAS AIRWAYS
CML	COLES MYER LTD	QBE	QBE INSURANCE GROUP
COH	COCHLEAR LIMITED	RAC	REINSRUANCE AUST
CPU	COMPUTERSHARE	RIC	RIDLEY CORPORATION
CRG	CRANE GROUP LIMITED	SEV	SEVEN NETWORK
CSL	CSL LIMITED	SGB	ST GEORGE BANK
CSR	CSR LIMITED	SGP	STOCKLAND TRUST GRP
CTX	CALTEX AUSTRALIA	SGW	SONS OF GWALIA
CXP	CRORPORATE EXPRESS	SHL	SONIC HEAL THCARE
DJS	DAVID JONES LIMITED	SMS	SIMSMETAL LIMITED
EML	EMAIL LTD	SPT	SPOTLESS GROUP LTD
ENE	ENERGY DEVELOPMENTS	SRP	SOUTHCORP LIMITED
ERG	ERG LIMITED	STO	SANTOS LTD
FMH	FINEMORES	SUN	SUNCORP-METWAY LIMITED
FLT	FLIGHT CENTRE	SWS	SIMEON WINES LIMITED
FCL	FUTURIS CORPORATION	TAH	TABCORP HOLDINGS LTD
FGL	FOSTER'S GROUP LIMIT	TCN	TECHNICHE
FOA	FOODLAND ASSOCIATED	TCL	TRANSURBAN GROUP
FXJ	FAIRFAX(JOHN)	TEL	TELECOM NZ CORPORATI
GLD	FOLDFIELDS LIMITED	TEM	TEMPO SERVICES
GMF	FOODMAN FIELDER	THG	THAKRAL HOLDINGS GRP
GNS	GUNNS LIMITED	TOL	TOLL HOLDINGS LTD
GWT	GWA INTERNATIONAL	VRL	VILLAGE ROADSHOW LTD
HVN	HARVEY NORMAN	VSL	VISION SYSTEMS
HWE	HENRY WALKER ELTIN	WAN	WEST AUSTRALIAN NEWS
JHX	HARDIE(JAMES)INDS	WBC	WESTPAC BANKING CORP
JUP	JUPITERS LIMITED	WES	WESFARMERS LIMITED
LAC	LANG CORPORATION	WMC	WMC LIMITED
LEI	LEIGHTON HOLDINGS	WOW	WOOLWORTHS LIMITED
LLC	LEND LEASE CORP	WPL	WOODSIDE PERROLEUM
LNN	LION NATHAN LIMITED	WSF	WESTFIELD HOLDINGS
MAY	MAYNE NICKLESS LTD	WYL	WATTYL LIMITED
MIM	M.I.M. HOLDINGS LTD	YTS	YATES

### Appendix B Observations in Each Year

1997	1998	1999	2000	2001	2002	2003	2004
AMC	AMC	AMC	AMC	AMC	AMC	AMC	AMC
	AMP	AMP	AMP	AMP	AMP	AMP	AMP
ANL	ANL	ANL	ANL	ANL	ANL	ANL	ANL
ANZ	ANZ	ANZ	ANZ	ANZ	ANZ	ANZ	ANZ
APN	APN	APN	APN	APN	APN	APN	APN
BHP	BHP	BHP	BHP	BHP	BHP	BHP	BHP
BIL	BIL	BIL	BIL	BIL	BIL	BIL	BIL
		BOQ	BOQ	BOQ	BOQ	BOQ	BOQ
BKL	BKL	BKL	BKL	BKL	BKL	BKL	
BPC	BPC	BPC	BPC	BPC	BPC		
BRL	BRL	BRL	BRL	BRL	BRL		
	BWA	BWA	BWA	BWA	BWA		
CBA	CBA	CBA	CBA	CBA	CBA	CBA	CBA
					CEP	CEP	CEP
CML	CML	CML	CML	CML	CML	CML	CML
COH	COH	COH	COH	COH	COH	COH	COH
CPU	CPU	CPU	CPU	CPU	CPU	CPU	CPU
	CRG	CRG	CRG	CRG	CRG	CRG	CRG
CSL	CSL	CSL	CSL	CSL	CSL	CSL	CSL
CSR	CSR	CSR	CSR	CSR	CSR	CSR	
CXP	CXP	CXP	CXP	CXP	CXP	CXP	CXP
	DJS	DJS	DJS	DJS	DJS	DJS	DJS
	EML	EML	EML				
ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE
		ERG	ERG	ERG	ERG	ERG	ERG
	FLT	FLT	FLT	FLT	FLT	FLT	FLT
FCL	FCL	FCL	FCL	FCL	FCL	FCL	FCL
FGL	FGL	FGL	FGL	FGL	FGL	FGL	FGL
FOA	FOA	FOA	FOA	FOA	FOA		
FXJ	FXJ	FXJ	FXJ	FXJ	FXJ	FXJ	FXJ
			GLD	GLD	GLD		
GMF	GMF	GMF	GMF	GMF	GMF		
GNS	GNS	GNS	GNS	GNS	GNS	GNS	GNS
HVN	HVN		HVN	HVN	HVN	HVN	HVN
HWE	HWE	HWE	HWE	HWE	HWE	HWE	HWE
JHX			JHX	JHX	JHX	JHX	JHX
					JUP		
LEI	LEI	LEI	LEI	LEI	LEI	LEI	LEI
MAY	MAY	MAY	MAY	MAY	MAY	MAY	MAY
NAB	NAB	NAB	NAB	NAB	NAB	NAB	NAB
NCM	NCM	NCM	NCM	NCM	NCM	NCM	NCM

**Appendix B Observations in Each Year (Cont)**

<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
NCP	NCP	NCP	NCP	NCP	NCP	NCP	NCP
NDY	NDY	NDY	NDY	NDY			
NFD	NFD	NFD	NFD	NFD	NFD	NFD	NFD
NVS	NVS	NVS	NVS	NVS	NVS	NVS	
OEC	OEC	OEC	OEC	OEC	OEC	OEC	OEC
OPS	OPS	OPS	OPS	OPS	OPS	OPS	
OSH	OSH	OSH	OSH	OSH	OSH	OSH	OSH
	PBL	PBL	PBL	PBL	PBL		
PDP	PDP	PDP	PDP	PDP	PDP		
PHY	PHY	PHY	PHY	PHY	PHY	PHY	PHY
	PLM	PLM	PLM	PLM			
PMM	PMM	PMM	PMM	PMM	PMM	PMM	PMM
PPT	PPT	PPT	PPT	PPT	PPT	PPT	PPT
PRK	PRK	PRK	PRK	PRK	PRK	PRK	PRK
TCN	TCN	TCN	TCN	TCN	TCN	TCN	TCN
PTD	PTD	PTD	PTD	PTD	PTD	PTD	PTD
QBE	QBE	QBE	QBE	QBE	QBE	QBE	QBE
RAC	RAC	RAC	RAC	RAC	RAC	RAC	
RIC	RIC	RIC	RIC	RIC	RIC	RIC	RIC
SEV	SEV	SEV	SEV	SEV	SEV	SEV	SEV
	SGB	SGB	SGB	SGB	SGB	SGB	SGB
SGW	SGW	SGW	SGW	SGW	SGW		
SHL	SHL	SHL	SHL	SHL	SHL	SHL	SHL
SMS	SMS	SMS	SMS	SMS	SMS	SMS	SMS
					SPT	SPT	SPT
SRP	SRP	SRP	SRP	SRP	SRP	SRP	SRP
STO	STO	STO	STO	STO	STO	STO	STO
SUN	SUN	SUN	SUN	SUN	SUN	SUN	SUN
SWS	SWS	SWS	SWS	SWS			
			TAH	TAH	TAH	TAH	TAH
				TCL	TCL	TCL	TCL
TEL	TEL	TEL	TEL	TEL	TEL	TEL	TEL
TEM	TEM	TEM	TEM	TEM	TEM	TEM	TEM
TOL	TOL	TOL	TOL	TOL	TOL	TOL	TOL
				VRL	VRL	VRL	VRL
VSL	VSL	VSL			VSL	VSL	VSL
WBC	WBC	WBC	WBC	WBC	WBC	WBC	WBC
WMC	WMC	WMC	WMC	WMC	WMC	WMC	WMC
WOW	WOW	WOW	WOW	WOW	WOW	WOW	WOW
WSF	WSF	WSF	WSF	WSF	WSF	WSF	WSF
			WYL	WYL	WYL	WYL	WYL
YTS	YTS	YTS	YTS				
<b>64</b>	<b>72</b>	<b>73</b>	<b>77</b>	<b>77</b>	<b>78</b>	<b>68</b>	<b>63</b>