

Executive options: don't throw baby out with the bathwater

Despite recent misgivings on various aspects of executive stock option plans, they remain an efficient device for aligning managerial and shareholder interests. **JEAN CANIL** and **BRUCE ROSSER** show there is a case for stock price hurdles or other restrictions, but these should be limited to avoid destroying options' incentive value.

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Executive stock options remain subject to ongoing public scrutiny. At the time of writing, several large companies are reviewing executive stock option plans in which their directors participate and the government has just come up with a formula for valuing options on the balance sheet.

Companies will naturally be concerned about the requirement to expense stock options when granted,¹ while critics claim many executive stock option plans are too generous. In several cases, restricted shares (more common in the United States) are being mooted as a replacement mechanism for aligning managerial and shareholder interests.

Any form of share ownership creates downside exposure, for what that is worth. If the underlying problem is to motivate executives to take risks that shareholders would prefer, then upside payoffs should dominate the argument. In this paper we set out to argue that options by their design are an efficient motivating device; the problem rests with how they are used.

Stock options are a form of equity-linked compensation where the payoffs are levered up relative to stock ownership. Options therefore provide a higher return to CEOs and executives than a lesser number of shares issued at the same total cost. The cost to shareholders of a granted option is equal to its value in the open market (Hall and Murphy, 2000). It can be

readily shown that options are the most cost-effective device for aligning executive and shareholder interests.²

Essentially, stock options not only provide more sensitivity than shares but do so without increasing an executive's portfolio exposure to the employing company's fortunes. If options elicit extra risk-taking, resulting in a higher stock price and exercise, then shareholders always gain irrespective of how many options are issued and on what terms.

But if exercise occurs as a result of stock price increases unrelated to incentive and effort, as in a bull market, then shareholders bear a cost: options having a market value were granted for no return.

Rappaport (1999) illustrates this argument in relative terms. Suppose a CEO is granted at-the-money 5-year options on one million shares which are now trading at \$15. Steady 10% annual growth implies a share price of \$24.16 in 5 years' time. If not exercised until then, the realised gain on each option would be \$9.16.

But if the share prices of competitors have grown by 20% over the same period, it is difficult to argue that inferior performance should be rewarded. Yet, the theoretical Black-Scholes value of the option at grant will still be positive even if the market expects the firm's competitors to do better.

Hurdle prices reduce the risk to shareholders of executives exercising

through good fortune, but it is not often recognised that hurdle prices (and indeed other restrictions) can be seriously detrimental to option incentives because the value of the option to an executive is then lower than its open market value or cost to the shareholders.

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Rappaport (1999) advocates indexed options which are stock options tied to either an industry or market index. Here, executives are rewarded only if their company's stock price outperforms the benchmark index. However, it is difficult to imagine how an executive of a successful firm would agree to tie compensation to an index which may be retarded by inefficiencies of competitors! Rappaport suggests offering more options at a discount to the index to offset this risk.

Given that executives have most of their investments and their human capital tied up in their employing company, they are undiversified investors. Risk-averse executives value granted options less than the theoretical Black-Scholes value.

Low probabilities of large option gains are discounted in favour of high probabilities of small gains. Restrictions on trading their options, such as qualifying periods, vesting restrictions and low anti-dilution protection and restrictions on short-selling stock all serve to lower the value to CEOs even further, and hence their incentive.

Shareholders can ease restrictions to restore incentive, but as a consequence executive stock options are then more likely to be exercised ("easier" to exercise) for non-incentive reasons. The sheer size (many CEO awards in large companies are for millions of options, especially on appointment) of stock option awards guarantees that the wealth consequences are not trivial.

In this article we look at recent arguments for and against executive

stock options. This is against a backdrop of large Australian companies shelving their executive stock option plans in favour of restricted stock grants.

Recent US evidence and theoretical insights suggest the value of executive stock options to CEOs is considerably

below their theoretical value, principally because CEOs already have most of their assets tied up in the company and because the options cannot be traded before the end of a usual two-year qualifying period. Even so, the sensitivity of option values to stock price changes remains high enough to ensure stock option awards are not just salary substitutes.

US EVIDENCE

US evidence is germane because no detailed examinations of these issues have been reported for Australia. The value of executive stock options as incentive devices was originally doubted by Jensen and Murphy (1990a, 1990b). They presented evidence that, for most US publicly held companies, the compensation of top executives was virtually independent of performance: on average, CEOs were found to receive only \$3.25 for every \$1000 increase in shareholder wealth.

However, their sample period predated the late 1980s and 1990s when stock options took hold as incentive-aligning devices. Since then numerous studies have been published on the issue of whether stock options "work".

Supporting earlier evidence documented by Murphy (1985), and in contrast to DeFusco, Zorn and Johnson (1990), Hall and Liebman (1998) cite additional evidence that they do. Using a 15-year panel data set of CEO equity-based compensation in the largest US companies,³ they found that virtually all of the pay-to-performance sensitivity

of equity-linked executive compensation was attributable to changes in the value of CEO holdings of stock and stock options.

Achieving a moderately above-median performance relative to a moderately below-median performance drove a difference of about \$4 million in compensation, while the difference in compensation between a first decile firm performance and a bottom decile performance was more than \$9 million.

Hall and Liebman further report that the responsiveness of CEO compensation to firm performance rose dramatically between 1980 and 1994, almost entirely due to the increased use of stock options, with the median elasticity of CEO compensation (including salaries, bonuses and stock options) with respect to firm market value more than tripling from 1.2 to 3.9 over that period.

The median Jensen-Murphy CEO return elasticity was upgraded to \$6 per thousand, and had increased four-fold relative to firm size (market capitalisation) during the sample period ending in 1994. Changes in the value of stock and stock options were found to be about 50 times greater than changes in salary and bonus.

Even so, pay-performance sensitivity does not constitute evidence that CEO contracts are efficiently designed so as to induce investment and financing decisions in shareholders' interests. To address this question we need to turn to recent theoretical developments.

RECENT THEORETICAL DEVELOPMENTS

For risk-averse CEOs the ideal incentive-aligning contracting solution is a one-to-one correspondence between the dollar increase in firm value and CEO compensation, that is, a 'sharing rate' of one.⁴

However, CEOs (apart from owner-managers) typically own small stock holdings that are grossly insufficient to deliver rewards on this scale. Even if the price of the share were to increase by 25% in one year, the gain on a holding of say 25,000 shares initially priced at \$20 is \$125,000. But, if the number of outstanding ordinary shares

is 10 million, shareholder wealth has increased by \$50 million, implying a sharing rate of only 1:400. In other words, a substantial movement in market capitalisation induces only a modest swing in CEO reward in dollar terms.

On the other hand, high sharing rates imply that CEOs will need to be rewarded for accepting the risk of large swings in their pay. That is, they will become risk-averse. Hall and Liebman demonstrate that CEO risk aversion coupled with a high sharing rate (say 1:10) may cause CEOs to avoid some high-risk positive NPV projects because undiversified CEOs will require a return to compensate for their exposure to firm-specific risks.

To illustrate, suppose the CEO of the \$200 million company referred to above is deciding on a project expected to increase firm value by \$10 million—an increment of 5%. Project success (raising firm value by \$30 million) and failure (decreasing value by \$10 million) are equally likely. A risk-averse CEO with a sharing rate of one would possibly reject the investment because there is a 50% chance of reducing his/her pay. A much smaller sharing rate (similar to before) helps to remove this disincentive, provided there are sufficiently large dollar outcomes for changes in market capitalisation.

The second difficulty relates to executives' valuation of their stock options. Several researchers now point to a valuation lower than market. Meulbroek (2001) estimates that undiversified executives of the average NYSE firm value their stock options at 70% of market, falling to 53% for high-risk Internet-based firms.

Similarly, Hall and Murphy (2000) estimate that CEOs with 50% of their wealth in company stock value stock options at 64% of their Black-Scholes value. Importantly, lower CEO valuations mean lower incentives, which is costly to shareholders.

An undiversified CEO is exposed to the total volatility of the firm, whereas diversified investors bear only the systematic (or market-related) portion of the firm's total risk. CEOs' expected returns are therefore too low to properly compensate them for the

higher risk. As a consequence, undiversified CEOs value all equity-based compensation below its market value.

An optimal executive compensation award balances the added costs of incentive pay against the benefits of improved incentive alignment.

The problem is unavoidable because exposure to firm-specific risk is necessary to create incentives to align managerial decisions with shareholder preferences. The difference (or gap) between the value of stock option compensation to undiversified CEOs and its market value is a deadweight loss (or cost) to the company's shareholders. This is so because the company could have sold the options on the open market at full value.

Clearly, the cost reduces incentive, and is higher as stock price volatility increases. In general, any restrictions related to the exercise or vesting of executive stock options increase this deadweight cost. Hence, non-tradability provisions, prohibition on short-selling the company's shares, restrictions on early exercise, vesting restrictions (i.e., exercise rationing) along with a non-zero probability of early CEO departure increase serve to increase the cost, or gap.⁵

Shareholders bear a further cost if CEOs take on more risk than shareholders prefer (because option prices are increasing in stock volatility), but neither theory nor evidence are supportive.⁶

WHERE TO FROM HERE?

Without proper incentive contracts, risk-averse managers forego profitable growth opportunities for fear of putting the value of their human capital (or reputation) at risk. An optimal executive compensation award balances the added costs of incentive pay against the benefits of improved incentive alignment.

As long as incentive pay is necessary to induce risk-taking, stock options

remain the most cost-effective way of aligning incentives. Share ownership does not achieve this because shares exacerbate an executive's lack of investment diversification, whereas stock options, unlike stock, have no downside risk.

At the same time, shareholders must be comfortable with the prospect of chance exercise. If not, shareholders can acquire protection by imposing restrictions on exercise such as hurdle share prices and vesting restrictions, but in doing so reduce the value of the options to the executive and hence his/her incentive to accept risks. This is costly to shareholders because the options could have been sold into the open market for their full theoretical value, the executive paid his value, and there would still be cash left over.

Boards face a trade-off when setting the exercise price for executive options. Setting an exercise price above market reduces the cost of the option to the company's shareholders, but also reduces CEO incentive.⁷ Setting an exercise price below market increases CEO incentive, but is more costly.

According to Hall and Murphy (2001), setting the exercise price at or near the grant-date market price maximises incentive by ensuring a relatively high probability of an ultimate payout, but it also means accepting the risk of executives making option gains not as a result of expending effort.

Of course, if growth opportunities are substantial, it is in shareholders' interests to bear a higher option cost in the expectation of increasing CEO incentive to grasp those opportunities. This is a complex problem, and its solution may not be transparent to shareholders who cannot see how opportunities and incentives interact through time.

Given incentive problems with imposing restrictions on options, another approach is to consider the executive's attitude to risk and effort. Tian (2001) looks at stock options, restricted shares and salary and shows that the optimal combination depends largely on the director's degree of risk and effort aversion and his non-firm-related investment opportunities.

His model allows shareholders to determine the size of the compensation package but allows directors to choose the components that make up the package. He shows that when a risk- and effort-averse director can choose how he is paid, a large proportion of the compensation will be incentive-based.

However, the proportion of incentive pay is negatively related to the level of risk and effort aversion. Stock options are chosen if the director has a low degree of risk and effort aversion, whereas restricted stock is issued when the director is moderately or highly risk and effort aversion. Tian further notes that incentive compensation is ineffective if the director is highly risk and effort averse.

The issue for shareholders is not so much how to pay their CEO but rather how to choose a CEO (and board members) with the same attitude to risk as their shareholders.

For instance, start-up companies are likely to attract shareholder clienteles characterised by low risk aversion. Such companies are therefore more likely to benefit from appointing an aggressive CEO who is attuned to shareholders' low level of risk aversion. For example, the value of biotech firms is a function of the quality of their R&D; although efficiency increases shareholder wealth, cost-cutting per se would reduce firm value.

In contrast, the skills required to run a mature firm are more likely to come from a CEO with an established reputation for nurturing efficiency and stability, i.e. to suit the preferences of institutional shareholders.

The same compensation package may not have the same value nor the same incentive effects for different executives because the incentive to expend effort depends on an executive's degree of risk aversion and private wealth.

Specifically, if a CEO is appointed to rationalise operations and improve efficiency, options are less predicated than in scenarios of risk-taking to secure growth opportunities. We argue that this aspect of the stock options debate deserves more attention than disclosure considerations.

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NOTES

- 1 See July 2000 Discussion Paper, Accounting for Share-based Payment.
- 2 Hall and Murphy (2000), Meulbroek (2001). This is assuming that directors are professional and not owner-managers where one director already holds a majority of voting stock or a very large blockholding (e.g. Westfield Holdings Ltd).
- 3 Panel data include proxy data that are estimated from structural parameters. For instance, exercise volumes may be estimated by this means when the year of exercise is not disclosed.
- 4 For example, see Hall and Liebman (1998), p. 656.
- 5 The cost is actually understated to the extent that executives' human capital investment in the firm, pension fund holdings skewed towards the company's stock and deferred compensation increase exposure to firm-specific risks.
- 6 For recent contributions, see Carpenter (2000), DeTemple and Sundaresan (1999) and Cohen, Hall and Viceira (2000).
- 7 Hall and Murphy (2001) set up an optimisation problem where the total cost of an options grant is fixed, leaving only the exercise price and grant size to be determined.