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Do compensation plans with performance targets provide better incentives? ☆

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ABSTRACT

Guided by academic literature, industry practice and policy recommendations, we analyze a wide range of option and restricted stock plans with exercise and vesting conditions that may be contingent on stock price performance. To assess the effectiveness of these plans at attracting and providing incentives to executives, we create compensation plans with fixed firm cost and executive valuation and calculate their expected total lifetime incentives. We show that performance vesting targets provide the least cost effective incentives, performance exercise targets provide the largest risk incentives, option plans are generally superior to restricted stock plans, and calendar vesting is only efficient up to a maximum of three years. Performance exercise targets can increase the expected total lifetime incentives provided by compensation plans, but in general, standard options with short vesting periods provide the most cost effective pay-for-performance incentives.

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1. Introduction

There has been considerable public outrage regarding both the amount paid to executive directors of larger firms and the fact that some of these executives can be rewarded regardless of performance. Some researchers even argue that remuneration policies might have contributed to the recent financial crisis (e.g. [Bebchuk et al., 2010](#)). In response, some governments and professional bodies have analyzed existent remuneration policies. Worldwide, the Financial Stability Board designed principles and standards that aim to improve compensation practices in financial institutions (see [Financial Stability Board, 2009](#)). Countrywide, policy documents have advised changes to the current remuneration policies of financial institutions. In the UK, the 2009 Walker Review states that Long Term Incentive Plans (LTIPs) might have motivated managers to take short term decisions and suggests that compensation plans should have vesting periods of up to 5 years and be subject to pre-vesting performance target conditions.¹ The use of performance target conditions in compensation plans was suggested previously in the [Greenbury \(1995\)](#) report.² Since the Greenbury report, UK firms commonly attach performance targets to their compensation plans. In the USA, although some researchers (e.g. [Bebchuk et al., 2002](#)) have argued in favor of performance target options, there seems to be less pressure from regulators towards the introduction of these target conditions in compensation plans. However [Lublin \(2006\)](#) argues that changes in accounting rules may well result in a widespread usage of performance target options by the US firms.

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¹ Similar recommendations also appear in the [Association of British Insurers \(2009\)](#) guidelines.

² This recommendation can also be found in the [Association of British Insurers \(2009\)](#) and in the combined code (2010).

Stock and option plans are typically justified on the grounds of attracting and providing incentives to executives in order to increase firm value (see e.g. Hall and Murphy, 2002). Nevertheless, it is unclear whether stock or options are the most effective at achieving these aims. Moreover, it is unclear how some of the features of stock and option plans can impact on the incentives provided by these plans. Hall and Murphy (2002, p. 5) argue that “incentives may be provided more efficiently through plans of restricted stock rather than options”. Dittmann and Maug (2007) also argue that stock should dominate options in compensation plans and that, optimally, CEOs should be granted no options. Moreover, the Greenbury (1995) report suggested that compensation plans with restricted stock may be more effective than options in linking pay with firm performance. Contrary to these studies, our results show that the use of options, to compensate utility maximizing risk averse executives, is consistent with maximizing total expected lifetime pay for performance incentives (and risk increasing incentives). This appears to justify why, in practice, firms do continue to include options in compensation plans.

Guided by industry practice and policy recommendations, and with the objective of assessing the incentives provided by different compensation plans, we develop an adaptable, dynamic option valuation model for restricted stock and option plans. In particular, we incorporate calendar vesting periods, exercise conditional on stock price performance and vesting conditional on stock price performance.³ In our multi-period dynamic model a risk-averse executive is granted either at-the-money American options or restricted stock. Consistent with Hall and Murphy (2002) and Carpenter (2000) the executive makes optimal exercise decisions to maximize terminal wealth utility. We also allow the executive to exercise the option or stock holding in stages (see Pollet et al., 2013). The possibility of exercise in stages allows for the analysis of different performance targets for each different option or restricted stock within a single grant.

As is typical in the literature, our analysis of the compensation plans focuses on determining the pay-for-performance sensitivity incentives, or the plan's delta, and the plan's incentives to increase the firm's risk, or the plan's vega. However, unlike other models that consider only incentives at the issuance date, we calculate the expected total incentives over the lifetime of the plan. In our analysis, the different plans result in the same firm cost and executive valuation, and so the best plan maximizes the incentives over the plan's lifetime. Naturally, a compensation plan with a larger expected lifetime delta should motivate further the executive to increase the stock price and is the best plan from a shareholder perspective. More contentious is the argument that the best plan should maximize the executive's incentive to take risk. In our model the executive is risk averse and thus, might want to avoid risky but profitable projects, or to seek risk reduction even if this risk reduction is costly to the firm (Smith and Stulz, 1985; Tufano, 1996). Dittmann and Yu (2011) show that, under optimal contracting, executive compensation practices should aim to provide risk incentives. Thus, plans which lead to a risk increase should better align the interests of risk averse executives with the interests of risk neutral shareholders.

The expected lifetime deltas and vegas are intuitive measures of the incentives and their duration. To provide a simplified example, consider zero interest rates and a risk-neutral executive which can be granted one of two possible contracts with the same cost and value to the executive. One contract has a constant 0.8 delta for one year, giving a lifetime delta of 0.8 and the other contract has a constant delta of 0.5 but an expected lifetime of 2 years, giving a lifetime delta of 1. The contract with the lifetime delta of 0.8 is inferior since, over a two-year period, issuing (sequentially) two contracts of the first type would produce a lifetime delta of 1.6 and issuing two (simultaneously) of the second type of contract would produce a lifetime delta of 2. Thus, the second contract provides larger overall incentives (and has the same cost and value) and is therefore superior.

It is typical (see e.g. Hall and Murphy, 2002; Dittmann and Maug, 2007) to consider the instantaneous delta at $t = 0$ without any consideration for expected lifetime. However, this could potentially lead to misleading conclusions since a plan can have a very large delta but subsequently be exercised (sold in the case of stocks) very shortly after issuance. As an illustration, for the plans we consider, the restricted stock with sliding scale sale has a very large instantaneous delta (see Table 3) as when $P = 1$ a very small increase in the stock price (to $P > 1$) would lead to an instant payoff of \$1. This discontinuous payoff (0 if $P \leq 1$ and 1 if $P > 1$) leads to large deltas but the incentive typically lasts only for very short periods of time, because as soon as the stock price moves above 1 the stock will be sold and all incentives will disappear.

If firms were only interested in instantaneous incentives then the issuance of contracts with discontinuous payoffs, such as digital options, would be current practice. Contracts with discontinuous payoffs will always lead to very large incentives to change share price but are often not ideal since those large incentives typically last only for a short period of time. This is because as soon as they move in the money, the executive is so concerned that they may drop back out-of-the money that they are immediately exercised.

Comparing standard restricted stock with vanilla option plans we find that, over the lifetime of the contract, vanilla option plans provide larger expected lifetime pay-for-performance incentives and larger expected lifetime incentives to increase the firm's risk. This result is an example of the trade-offs between the value of the plan to the executive, the cost to the firm, the pay-for-performance incentives, and the expected lifetime. The results show that when keeping the cost of the contract fixed, the standard restricted stock plan is generally more valuable to the executive, but vanilla options have larger instantaneous pay-for-performance incentives (deltas), vegas and expected lifetimes. Rational executives sell their standard restricted stock plans as soon as possible which results in these instruments having short expected lifetimes. A possible way to increase the expected lifetime is to increase the vesting period, yet increasing the vesting period reduces the value of the compensation plan to the executive. This value reduction results in a restricted stock valuation and pay-for-performance incentive that is below that of

³ As a robustness check we also consider compensation plans in which vesting or exercise are conditional on accounting performance targets. Our main findings do not change.

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