ON THE PROS AND CONS OF EMPLOYEE STOCK OPTIONS: WHAT ARE THE ALTERNATIVES?

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Abstract

Despite theoretical validity, there is mixed empirical evidence on whether employee stock options align the interests of management and shareholders by turning managers into owners. Yet, recent accounting scandals, excessive payouts, and the public's call for a proper recognition of stock option grants have produced considerable debate in boardrooms and the financial press about the desirability of using stock options. This paper provides an overview of the empirical research in the field and discusses the advantages and disadvantages of using stock options as part of an employee's compensation package. In light of the recent accounting scandals, regulatory bodies have been hard pressed to change the accounting treatment and recognition of stock options. As a result, practitioners and academics are increasingly on the lookout for alternative forms of compensation tools. To aid in the ongoing discussion, we propose a number of alternative compensation tools that help alleviate some of the problems inherent in stock options, while still rewarding a manager for his performance and aligning management and shareholder incentives. While there is no clear-cut answer as to what compensation tool is best, our study should provide corporate managers with the necessary insights that are needed to choose the method that most closely meets their objectives. In addition, our study aims to open the door for further academic discussion that is required to address a number of questions that remain unanswered in this area.

Keywords: stock options, executive compensation

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1. Introduction

The most pronounced change in corporate compensation practices over the past decade is the escalation and recent decline in executive and employee stock options. In 1992, firms in the Standard & Poor's 500 granted their employees options that were worth a total of $11 billion on the granting date; by 2000, the value of option grants in S&P 500 firms increased to $119 billion. By 2002, option grants in the S&P 500 had fallen to $71 billion, well below their peak but still a six-fold increase from a decade earlier. Despite — or perhaps because of — their growing importance, employee stock options (ESOs) have become increasingly controversial. At first, the use of ESOs increased primarily for the board of directors and upper management levels. Gradually, the use spread to lower ranks, and today ESOs are widely used in almost every industry. As the use of ESOs increased, so too did the interest of academics. From an academic as well as a practical viewpoint, ESOs affect everything — from a company's compensation policy to its capital structure, and from a firm's accounting earnings to its investment decisions. If implemented properly, ESOs can be used as a functional tool to streamline a company's compensation policy or capital structure. If implemented improperly, they can destroy shareholder value, overpay or demoralize employees, or even bankrupt the company. It is therefore crucial that management understands the mechanics of ESOs, as well as their benefits and downsides, before implementing an employee stock option program.

The mechanics of ESOs are similar to traded stock options when the major determinants of option values (the current stock price, the strike price, the maturity date, and the stock price volatility) are taken at face value. But there are some caveats: ESOs are inalienable, normally the options cannot be exercised until vested, and exercise of the options creates new shares. A key to understanding ESOs, and their popularity, can be found in their accounting treatment, which is held in high regard by a majority of companies that use stock options, but is widely criticized by the popular press. The embedded and implied costs associated with ESOs are not recognized in a firm's profit and loss statements, which essentially suggest that ESOs are free to the

company. The perceived low costs have caused companies to issue large amounts of stock options instead of standard paychecks, which in some cases led to an over-issue of ESOs. As the most widely used incentive-compensation tool, ESOs have been widely researched from a variety of perspectives. While most prior research on the topic agrees that the use of ESOs has advantages, shifting academic and public opinion on this subject prevents full agreement on specific benefits.

The main argument in favor of stock option plans is that they give executives a greater incentive to act in the interests of shareholders by providing a direct link between realized compensation and company stock-price performance. In addition, offering employee stock options in lieu of cash compensation allows companies to attract highly motivated and entrepreneurial employees, and also lets companies obtain employment services without (directly) expending cash. Moreover, stock options encourage executive risk taking which can mitigate problems with executive risk aversion. Finally, stock options provide an opportunity to award managers when data noise makes it difficult to determine performances. Despite theoretical validity and wide-ranging empirical research, there is mixed evidence on whether stock options provide a solution for the horizon problem[1], and whether tax advantages provide a driver for companies to use stock options. Furthermore, academic theory and the practitioneroriented literature suggest that stock options provide both an opportunity to issue shares at a premium and a tool to retain key personnel. However, there is no empirical research on either proposition. But the incentives provided by stock options have also been criticized. Aside from the hype in the press and popular literature, the academic literature shows that stock options cause a deadweight loss to firms because employees value their options substantially below market value, foster opportunistic behavior by management with respect to the timing of the stock-option awards, and, most importantly, lead to a dilution of share capital. Recently, a number of academicians have also suggested that companies should discard stock options to avoid losing out on their tax loss shield, which is an important driver of firm value. Although stock options provide incentives to employees to improve the stock performance of their firms, stock options also result in an agency cost as they can act as an antitakeover device and are thus misaligned with shareholder interest.

Finally, the recent accounting scandals at Enron, WorldCom, Global Crossing and other companies, have been linked to excessive risk taking and an excessive fixation on stock prices, both allegedly caused by an escalation of option grants (Cassidy, 2002; Madrick, 2003). These scandals have focused attention on problems with current accounting practices, which in turn has opened a debate on the accounting treatment of employee stock options. Under current U.S. accounting rules, companies generally do not treat options as an expense on their financial statements. Proponents of expensing options argue that expensing them will generate more informative financial statements and improve the credibility of reported earnings. Opponents of expensing worry that it will cause companies to grant fewer options, especially to lower-level employees. As of today, the Financial Accounting Standards Board (FASB) has been lobbied by various industries and has decided to postpone the requirement that stock options to be reported as expenses until the end of 2005. As public criticism remains high and regulatory changes are on the horizon, more and more firms are facing the question whether they should continue awarding stock options to their employees or whether they should use alternative compensation methods. Our study aims to help practitioners in their decision process by providing a detailed overview of empirical findings as they relate to the advantages and disadvantages of stock options, and by providing suggestions for possible alternatives. Accordingly, the paper is organized as follows: In the following section, we describe the advantages of stock options, whereas Section 3 outlines their disadvantages. Section 4 discusses alternatives to stock options including compensation methods that are uniquely tied to value creation as well as other forms of derivate instruments. In Section 5, we summarize our findings and provide concluding remarks.

2. Benefits Of Employee Stock Options

The incentive effects of salary and bonus changes are approximately fifty-three times smaller than those from stock options for a given change in firm value (Hall and Liebman, 1998). Other researchers such as Demsetz and Lehn (1985), Himmelberg, Hubbard and Palia (1999), Core and Guay (1999), Rajgopal and Shevlin (2002), and Hanlon, Rajgopal, and Shevlin (2003) predicate their analyses on the premise that the granting of options is consistent with firm value maximization. These are not the only benefits of stock options, however. Other advantages can be summarized as follows:

2.1. Alignment Of Interests

One of the widely accepted advantages of using stock option compensation is that the agency conflict between managers and shareholders is reduced[2].

[1] The horizon problem occurs when CEOs nearing retirement forego valuable R&D and investment opportunities, as they may not realize operating results of profitable investments during their reign, leaving all the profit for the successor (Yermack, 1995).

[2] See also Jensen and Meckling (1976), Haugen and Senbet (1981), Smith and Stultz (1985), Lambert (1986), Copeland and Weston

Managers who receive stock options have incentives to take actions that increase shareholder wealth, resulting in an increased alignment of interests. Empirical studies on the subject provide evidence of this: Smith and Watts (1992) and Yermack (1995) find that in most, though not all, regulated industries companies award less ESOs, with the notable exception of the banking industry. The results of the two studies (and earlier work, see Yermack (1995)) provide strong evidence that ESOs are indeed used to align interests and provide incentives for management to excel whenever possible (i.e., in non-regulated industries). More evidence of incentive alignment is presented by Datta, Iskander-Datta, and Raman (2001), who investigate the relation between the market reaction to takeovers and merger announcements and equity-based compensation. Their study shows that, after controlling for exogenous variables, there is a significant and highly robust negative relation between the acquisition premium paid and equity-based compensation. The incentive-alignment argument is recognized by investors: Datta et al. document a significant positive relation between abnormal share price performance around the takeover announcement date and equity-based compensation at the purchasing firm. Oyer and Schaefer (2004) present an extensive discussion of the potential benefits of stock option usage in firms. They argue that the incentive effects from options for lower-level employees are likely to be insignificant and outweighed by the cost of exposing employees to risk. Since incentive alignment is the key reason to issue ESOs, it has received the majority of attention in the academic literature. Although there is no consensus on whether there is indeed a relation between stock options and share-price performance, the scale does seem to tilt towards the protagonists of ESOs and incentive alignment, like Smith and Watts (1992), Yermack (1995), Datta et al. (2001) and Core and Larcker (2002), among others. Of the researchers finding no relation between incentive alignment and ESOs and/or managerial ownership, Himmelberg, Hubbard, and Palia (1999) focus solely on shares, whereas DeFusco et al. (1991) rule out any causal relation in their findings that contradicts agency theory due to severe limitations in their study. In summary, although different studies use different research methods that sometimes make a comparison difficult, the concluding observation is that CEOs are no longer paid as bureaucrats.

2.2. Attract Key Personnel

Due to the vesting period, ESOs can serve as a particularly useful tool to attract and retain key personnel. An employee with a large package of options will forego the value of all unvested options if he decides to leave the firm and is forced to exercise his vested options immediately, an irrational exercise since it is before maturity. Moreover, the employee might expect to be compensated for the loss of his ESOs, making him expensive for any future employer. Because this assumption seems so obvious, there has been little academic research into the subject, except for some human resource studies investigating at which price employees are willing to leave a current job for a new challenge. A potential benefit of providing compensation in the form of options is that the company can attract employees without spending cash.

However, this benefit must be weighed against the compensating differential demanded by option-holding employees. Companies paying options in lieu of cash are effectively borrowing from employees, receiving employment services today in return for highly variable (and often non-existent) payouts in the future. But risk-averse undiversified employees are unlikely to be efficient sources of capital, especially compared to banks, private equity funds, venture capitalists and other investors who specialize in managing risk and providing capital. The empirical evidence that companies grant options to conserve cash is mixed. Core and Guay (2001) find greater use of employee options in firms facing financial constraints.

However, in a study of new economy firms, Ittner, Lambert and Larcker (2003) find that companies with *greater* cash flows use options more extensively. Indeed, option-intensive companies like Microsoft, Intel and Cisco are well known for paying cash compensation above competitive levels, and Microsoft and others routinely use their excess cash to repurchase shares to reduce the dilution caused by large option grants.

The euphoria surrounding the bull market of the late 1990s led many employees to clamor for stock options, which might suggest that companies could attract workers by offering options while reducing other components of compensation. Most broad-based option plans are added on top of existing competitive pay packages. It is not surprising that employees clamor for such options when they are largely add-ons. But since employees are unwilling to pay close to the full cost of their options, broad-based options are an inefficient substitute for cash compensation and therefore an inefficient way to attract employees. Paying options in lieu of cash compensation will affect the type of employees the company can attract. For example, highly motivated and entrepreneurial employees who believe they can increase company stock prices will be attracted to companies offering relatively more option-based compensation. Whether this benefit justifies the compensating differential "charged" by employees for accepting risky compensation depends on the strength and value of this sorting and on the availability of other (less

(1988), Lambert, Larcker, and Verrecchia (1991), Hirshleifer and Suh (1992), and Hemmer, Kim, and Verrecchia (1999).

costly) measures of managerial characteristics. In any case, this rationale for stock options as an attraction device is limited to top managers and perhaps to some key engineering or technical employees who can directly affect company stock prices, and these individuals account for a small fraction of the option grants.

For lower-level positions in the corporate hierarchy, paying options in lieu of cash compensation will attract employees who are relatively less risk-averse. However, if attracting less risk-averse employees is an important objective, offering bonus plans tied to performance measures can provide both sorting and incentives, while payments to lower-level workers based on stock prices will provide sorting but not incentives. In summary, it is difficult to justify using options to achieve objectives related to attraction. At best, paying in stock options may help the company attract entrepreneurial top managers or some key engineering or technical employees, but it is difficult to tell a compelling story about the benefits of using stock options to attract lower-level employees.

2.3. Employee Retention

Oyer (2004) argues that options may be useful for retention purposes. He shows that if stock prices and labor market conditions are positively correlated, then unvested options serve to index employees' deferred compensation to their outside opportunities, and thus reduce transaction costs associated with the renegotiation of compensation. Granting stock options has become a necessity in competitive international labor markets, where retaining and attracting highly qualified personnel is an outright challenge. Therefore, employee stock options reduce a firm's systematic risk (Duffhues, 2000). The retention incentives created by employee options are highest when the stock price is already well above the exercise price of the options and when the employee must remain in the job before being able to exercise the option. Retention incentives are lowest when options are underwater and essentially valueless, especially when alternative employers are willing to make a new grant of more-valuable options. Options clearly provide retention incentives, but do they do so in the most efficient manner?

Retention incentives can be created by any compensation mechanism that makes it worthwhile for employees to stay with their current employer rather than to accept an outside offer. For example, retention incentives can be provided by deferred compensation or pensions that depend on remaining with the firm, or by paying employees less early in their career but later (Lazear, 1979). Alternatively, firms can offer explicit "retention bonuses" to critical employees staying a specified period of time; indeed, such retention bonuses are quite common in situations where a firm is in financial distress. Since risk-averse employees value cash more than options, it seems plausible that explicit cash retention bonuses are a more cost-effective method than options of inducing continued employment. In addition, it is not obvious that retention incentives should optimally vary with company stock prices. Suppose, for example, that all firms in an industry offer identical compensation packages consisting of a base salary and an option grant with an exercise price equal to the grant-date market price. In a bull market, stock prices rise above the exercise price of the options and all workers will find it advantageous to stay with their current employers. But, in a bear market, stock prices fall below the exercise prices and workers will rationally leave their current firm to join a competitor offering a fresh compensation package. In recent years, this latter scenario has been plaguing much of Corporate America, where option-based retention incentives have evaporated along with shareholder returns.

2.4. Creating Higher Profits

Although considered unimportant in the academic literature, reported earnings are held in high regard in the professional world. Because of the accounting-friendly treatment of ESOs, it is natural to assume that companies use ESOs as a large part of their compensation package to artificially inflate earnings. A less obvious phenomenon is that many companies have outstanding loan agreements, which include so-called debt covenants. Under a typical debt covenant, the interest rate of a loan increases if the borrower's financial position worsens, e.g., when the net income, EBIT or EBITDA drops below a certain threshold. By using non-recognized options as compensation, the company can avoid breaching the debt covenants. Matsunaga (1995) indeed finds that firms otherwise engaged in window-dressing (such as inventory accounting (LIFO/FIFO), depreciation schedules, amortization schedules, and the accounting for tax credits using flow-through methods) are more likely to use ESOs as a form of compensation. Furthermore, Matsunaga finds a negative relation between the extent to which a firm is below its target income level and the use of ESOs. The latter conclusion suffers from a notable limitation, namely that the implied relation is to some extent mechanical, resulting from an unmanaged income.

Consistent with Matsunaga (1995), Yermack (1995) uses interest coverage as a common proxy for large financial reporting costs, arguing that firms with low interest coverage are more likely to adopt non-recognized ESOs to reduce the risk of violating debt covenants. Whereas Matsunaga finds some evidence that supports the hypothesis, Yermack's results are insignificant. The profit argumentation is of heightened importance for R&D-intensive industries, such as the oil and gas industry and the biotech industry. Aboody (1996) concludes from his research into recognition versus disclosure of R&D

expenditures at oil and gas companies that recognition of a write-down causes a significant negative market reaction, whereas disclosure causes no significant reaction[3]. In a comment letter to the FASB in response to the proposed mandatory recognition of ESO costs[4], the biotech industry claims that, as a result of compliance, reported earnings would be reduced, limiting its access to capital, which in turn would cripple R&D (Dechow et al., 1996). By examining share price reactions to events that increase the likelihood of mandatory expensing of ESOs, evaluating the arguments of lobbyists against mandatory expensing of ESOs, and the likelihood that cash-starved companies are more inclined to compensate employees with ESOs, Dechow et al. attempt to ratify the merit of the biotech industry's and Aboody's argumentation. Their findings are surprising and contradict Matsunaga's (1995) and Aboody's (1996) results. Dechow et al. find no proof that mandatory expensing of ESOs would limit a firm's access to capital, and claim these findings are consistent with the popular view that the cost of capital argumentation is abused to disguise management's self-serving behavior. Dechow et al. give a plausible explanation for their findings by claiming that the probability of the proposed mandatory expensing of ESOs always remained negligibly small, thereby limiting share-price fluctuations at announcements. Espahbodi et al. (2002) take Dechow et al.'s research (1996) to the next level by focusing solely on the share-price impact of proposed changes in accounting regulations by issuance of Exposure Drafts. Although similar at first sight, the studies are actually quite different: Dechow et al. mainly focus on the lobbying against the Exposure Draft on stock options; Espahbodi et al. focus on actual FASB actions in the run-up to the issuance of the Statement of Financial Accounting Standards (SFAS) 123 in 1995. Whereas Dechow et al. do not observe a relation between higher reported profits and the use of ESOs, Espahbodi et al. find a relation. They confirm that firms show significant negative and positive abnormal returns around the issuance of Exposure Drafts, proposing recognition of ESO costs and disclosure of ESO costs, respectively.

Moreover, confirming the biotech industry's views, abnormal returns were most significant for high-tech, high-growth and start-up firms. There is also a positive relation between the share-price reaction and the tax-loss of carryforwards, implying that a positive EPS impact is of even more importance when it is not cancelled out by the loss of a potential tax shield of ESO costs.

The results show that, although investors are aware of the costs of ESOs due to disclosure, actual inclusion in bottom-line EPS does affect a company's equity value. Except for the notable exception of Dechow et al.'s research into the biotech industry, the empirical findings show that the profit argument is an important benefit of ESOs: firms with low interest coverage increasingly issue stock options to improve it; firms otherwise engaged in window-dressing increasingly award stock options; and proposed changes of regulations to recognize stock-option expenses depress share prices. Moreover, Dechow et al.'s contradictory findings are at least partly explained by the fact that their research focuses on potential changes in accounting regulations that were never very likely to occur.

2.5. Tax Advantages

Stock option plans can bring about considerable tax advantages for employees and firms (Beatty, 1995; and Conyon and Murphy, 1999). Employees and their companies do not owe income tax on any capital gains in the stock until they either exercise their options or sell their shares on the open market (depending on the type of option involved). Graham, Lang and Shackelford (2004) point out that despite the massive size of option-related tax deductions, the net effect of option compensation is most likely a revenue gain for the US Treasury because of the income taxes that employees pay at exercise. Hence, option compensation cannot be explained as a tax-saving strategy (Core and Guay, 2001).

2.6. The Ability To Issue Shares At A Premium

Provided ESOs are struck out-of-the-money, they give the company an opportunity to issue shares at a premium as compared with today's share price. Disregarding the abovementioned benefits and the costs (noted below), ESOs show a similarity to warrants. If management deems its shares to be undervalued, it might decide not to issue shares at the current price, but instead issue warrants with a strike price above the current share price. The firm now has the best of both worlds: if the share price rises, the warrants will be exercised at a premium to current levels. Conversely, if the share price remains constant or even drops by a small margin, the warrant will not be exercised. Unless the company really needed the cash from a share offering, it still is in a fairly good position: it has not issued shares at what it deems to be a low share price, but it still received the premium paid by investor for the warrants. Additionally, for declining share prices, the company did not burden its new investors with losses on their shares, which could close the equity markets for issues in the future. The

[3] Although Aboody's research is fundamentally unrelated to the ESO question, it does shed an interesting light on the general recognition versus disclosure question to which ESOs are subject. Moreover, it is reasonable to assume that the disclosure or recognition of R&D expenses has a similar impact on the firm as the disclosure or recognition of ESO expenses.

[4] On June 30, 1993, the FASB issued an Exposure Draft, requiring the estimated value of ESOs to be recognized as an expense.

case for ESOs is identical, except that ESOs do not induce a cash inflow, but rather prevent a cash outflow in the form of compensation payments. When considering the fact that companies issue convertible bonds to benefit from low interest rates and the opportunity to issue shares at a premium in combination with the similarities between convertible bonds and stock options, the rationale for issuing convertibles and stock options must be similar as well, ceteris paribus. However, no empirical research is available to support the theory.

2.7. Overcoming Liquidity Constraints

ESOs cause no cash outflow for the firm, and can even result in a cash inflow in the case of a good share price performance. Inderst and Müller (2003) show that option compensation can be beneficial because it lowers a firm's compensation bill in economic downturns in which owners should have full cash flow rights in order to induce efficient strategic decisions. One would therefore expect that firms facing liquidity constraints would divert a larger part of the compensation package to ESOs. The currently available research defines liquidity constraints in a number of ways, for instance, as a low dividend yield or as a low payout ratio (which is essentially a derivative of the dividend yield). Using dividends as a proxy for the liquidity position is a disputed measure among researchers; most researchers present caveats warning that low dividends do not necessarily imply liquidity constraints. For instance, Miller and Modigliani (1961) state that investors (in a perfect market) should be indifferent towards firms' dividend policies, implying that a company's dividend policy is subject to numerous factors, of which the liquidity position is only one. In addition, some might argue that the dividend vs. stock-option subject is a chicken-and-egg story: managers might lower or even abandon dividend payout to increase the value of their options. The ultimate indicator of liquidity constraints is bankruptcy; if a company is truly cash-starved; it cannot meet its financial obligations and will have to file for bankruptcy. Gilson and Vetsuypens (1993) investigate 77 companies that have filed for bankruptcy or privately restructured debt to avoid bankruptcy between 1981 and 1987, the era for hostile takeovers and corporate raiders. They find that 60 percent of the companies replace their CEO with an outsider in a given year around the bankruptcy event, and that new CEOs are on average paid 36 percent more than their predecessors. Although the higher wage for the new CEO might seem illogical, the newly appointed CEOs typically receive larger option grants as part of their compensation package. Both Yermack (1995) and Smith and Watts (1992) investigate the liquidity argumentation from the dividend perspective. Yermack finds that the ratio of the stock option vs. cash component in the package almost doubles in firms paying no dividends. Similarly, Smith and Watts find a negative relation between dividend yield and the use of ESOs. DeFusco et al. (1991) conduct research along the same lines and find that within a 5-year period following the adoption of an ESO plan the payout ratio increases, while the debt ratio decreases, which in turn appears to be driven by a decline in profitability. Even though Yermack (1995) admits that there is some merit in DeFusco et al.'s (1991) argumentations, he states that they fail to explain the magnitude of the shift of cash-based compensation to option-based compensation. A decrease in the dividend yield from 3 percent to 0 percent increases the value of ESOs by about 60 percent — too low to account for the observed near doubling of the ratio of options to cash compensation. In conclusion, the liquidity constraint should provide a theoretically valid rationale for increased ESO use, but empirical evidence disputes this. The reason for this is that most researchers focus on dividends as a sign of liquidity constraints. However, all the research that finds a negative correlation between dividends and stock options suffers from the limitation that dividend payment is increasingly affected by the internal causality that stock options might cause lower dividends. Although Yermack's (1995) study suffers from the same limitation, he defends his findings by stating that the magnitude of the shift away from dividends is not solely explained by the existence of stock options, making the liquidity constraint more compelling. Empirical evidence from the true liquidity constraint angle is provided by Gilson and Vetsuypens (1993), who find that bankrupt companies increasingly switch to stock options as a compensation method in the years surrounding the bankruptcy or restructuring event.

2.8. Overcoming Noise In The Underlying Data

When accounting data contain substantial noise, monitoring management's performance and consequently awarding bonuses become increasingly difficult tasks for the board of directors. By relying on the fact that the effects of managerial decisions will crystallize in the future, it makes sense for the board of directors to base the compensation increasingly on future share-price performance, which will inevitably incorporate the quality of today's managerial decisions. Initial evidence for their argument is provided by Eaton and Rosen (1983) who define firms with fewer workers, lower assets, less advertising, and a lower variance of returns as firms with low monitoring costs and little data noise. Their research finds a positive relation between the noisiness of the data and the use of stock options at the expense of salaries, bonuses, and pensions. Sloan (1993) compares the use of accounting earnings-based compensation and stock pricebased compensation for top management. He finds that earnings-based compensation is more frequently used in firms where

firm-specific stock returns have a higher association with market-wide movements in equity values, earnings have a higher association with firm-specific changes in value, and earnings have a less positive association with market-wide movement in equity values. From the second finding, we can conclude that stock-based compensation is used more often when earnings changes do not automatically translate into stock-price changes, or in other words, when the accounting earnings contain a large amount of noise.

2.9. Mitigating Risk-Related Incentive Problems

Financial theory suggests that managers without equity-based compensation are oftentimes too focused on reporting short-term accounting profits, and in particular on short-term stability to increase their own job security. The rationale for this is that the manager's financial upside is capped, whereas his downside risks include, amongst others, losing his job. Consequently, managers sometimes pass up risky, yet profitable, investments in favor of stable, but less profitable investments. Stock options should mitigate this problem, since managers are forced to focus more on profitability to increase their own compensation package. Conversely, the downside of the risk-related incentives of ESOs is that managers may be motivated to take excessive risks to increase the value of their ESOs. After all, managers can influence the value of their current stock option package by making riskier decisions, since riskier decisions are eventually translated into a higher stock-return volatility, which in turn increases the Black Scholes value of the stock options. Although there is much anecdotal evidence, academic conjecture, and hefty speculation in the popular press, hard empirical evidence of increased managerial risk-taking directly resulting from ESOs is scarce. Bizjak, Brickley, and Coles (1993) claim to be among the first to provide some empirical evidence that ESOs provide incentives for managers to adopt long-term views and invest in profitable, yet risky investments. They claim that managers know that the market is sophisticated enough to recognize profitable projects and will reward the company in the long run, thereby providing managers with an incentive to invest rationally, instead of over- or underinvesting to create short-term paper gains. Unfortunately, Bizjak et al.'s research is subject to flaws, according to Wruck (1993). Wruck comments that Bizjak et al.'s empirical tests do not focus on the relation between investment decisions and the structure of compensation contracts as the model suggests, but rather on the cross-sectional relation between the sensitivity of CEO pay to stock-price performance and various asymmetric information proxies. Instead, Wruck concludes that companies with high information asymmetries (between managers and investors) adopt a compensation plan that concentrates on equity-based compensation. Conyon et al. (1995) illustrate very small pay-performance sensitivity in the UK by arguing that stock options may make managers non-neutral with respect to risk-taking. DeFusco et al. (1991) support this hypothesis and find that firms announcing the adoption of employee stock option plans experience a significant increase in the variability of stock returns.

Rajgopal and Shevlin (2002) examine stock option usage among oil and gas producers and provide empirical evidence on the relation between ESOs and managerial risk taking by treating (oil and gas) exploration risk and ESO risk incentives as endogenous variables. Using the Sunder model (Sunder, 1976), their research shows that the coefficient of variation of future cash flows from exploration activity exhibits a positive association with the sensitivity of ESOs to stock-return volatility.

Interestingly, the research shows that the ex-ante opportunity set, and not the ex-post exploration risk, determines the ESO risk-incentive setting. According to Rajgopal and Shevlin, this conclusion supports earlier findings of Holthausen, Larcker, and Sloan (1995). The research also shows that ESO sensitivity to stock-return volatility is negatively related to hedging of oil and gas price exposure. In other words, managers with ESO exposure are more inclined to rely on the old finance fundamental that investors can hedge for themselves, if so desired, and forego costly hedging activities[5]. Tufano (1996) interprets his evidence of decreased hedging behavior associated with stock options as a symptom of managerial opportunism. The notion that managers are motivated to take excessive risks for personal gains as a result of ESOs is contradicted by the research of Carpenter (2000), who shows that for risk-averse managers, the preferred asset volatility converges to a constant as asset value goes to infinity. In addition, giving managers more options also encourages them to reduce risk. One of the assumptions implied above still holds its ground though: options with a far out-of-the-money strike price do provide an incentive to increase risk[6].

2.10. Eliminating The Horizon Problem

As noted earlier, the horizon problem hypothesis predicts that CEOs nearing retirement will forego valuable R&D and investment opportunities, as the operating results of profitable investments will not crystallize during the current CEO's reign, leaving all the profit for the successor. Since sophisticated investors can identify profitable investments and

[5] Unlike finance theory sometimes leads us to believe, hedging is a costly activity. Since there is no perfect market, hedging entails bid/ask spreads, broker fees, potentially costly margin calls, etc.

[6] The repricing of ESOs after a bad share-price performance is partly explained by this (Carpenter, 2000).

reward the company accordingly, the literature suggests that increasing the performance-based component of the compensation package could offset the horizon problem. In his broad research, Yermack (1995) finds no increase in stock options as the CEO approaches his retirement age. Yermack leaves open the possibility that companies gradually increase the stock-option component so that CEOs will have an extensive stock option package when they near retirement age, but some further investigations indicate no significant difference in vested options or stocks for CEOs between the ages of 58 and 65.

Dechow and Sloan (1991) note that the horizon problem may be an incentive for companies to increase the performance-based part of the compensation package. First, they confirm the validity of the horizon problem by finding a significant decrease in R&D spending by CEOs nearing retirement. Second, they find that the decrease is mitigated through the CEO holding stock and stock options. Dechow and Sloan do not necessarily contradict Yermack's results. As Yermack himself mentions, even though he finds no increase in ESO awards towards retirement, he cannot exclude the possibility that the executives have amassed enough outstanding ESOs from previous years to provide incentives to mitigate the horizon problem. The research published on stock options as a potential tool against the horizon problem is sparse and in some cases outdated. Lewellen et al. find that companies do indeed award stock options to circumvent the horizon problem, but their research focuses on 1963–1973, and it is therefore not surprising that subsequent researchers such as Yermack contradict their results. Overall, the sparsely available evidence is insufficient and contradictory; stock options might be a suitable solution to the horizon problem according to theory, but empirical research does not fully support the theory.

3. The Disadvantages Of Employee Stock Options

The trouble with options is that too many options are granted to too many people. Most options are granted below the top-executive level, and options are often an inefficient way to attract, retain and motivate executives and especially lower-level employees (Hall and Murphy, 2003). Despite these shortcomings, the case for granting options to top executives is more compelling. For example, options may help attract entrepreneurial managers and also provide top managers with incentives to take actions that increase the stock price. But even for top managers, there are good reasons to question whether the "traditional stock option" — that is, a ten-year option with relatively short vesting and an exercise price equal to the grant-date market price — represents the most efficient way to provide stock-based incentives. Jensen and Murphy (1990) and Lambert and Larcker (2002) highlight dysfunctional effects of stock option plans and do not find a strong link between stock options and performance.

3.1. Excessive Use

Hermalin and Weisbach (1998) and Shivdasani and Yermack (1999) provide evidence that members of the board of directors, some of whom are members of the compensation committee, serve at the discretion of the CEO. Baker and Gompers (1999) also find that outside directors lack the economic incentives to curb excessive compensation. Senior executives have substantial influence over their pay; as a result, executives may receive compensation in excess of the level that would be optimal for shareholders. Similarly, labor interest groups such as the AFL-CIO have long argued that option compensation paid to CEOs is excessive and is unrelated to firm performance[7].Some research argues that options represent an inefficient way of compensating managers. Meulbroeck (2001) argues that risk averse and undiversifed managers do not attach sufficient value to the risky payout from an option to justify the cost borne by shareholders.

3.2. Deadweight Loss

Since stock options are usually subject to restrictions such as a minimum holding period, inalienability, and barrier features, the option-receiving manager is forced to hold a substantial part of his portfolio in his employer's options. Moreover, the manager is usually not allowed to enter riskmitigating positions by writing call options, short-selling shares, or buying put options. Because of the manager's resulting inability to diversify, his position will be substantially below Markowitz's efficient frontier (Markowitz, 1952). From this inefficiency, it follows that the manager's equity-based compensation renders too low an expected return to compensate for the concentration of risk.

Consequently, the manager values his equity-based compensation below its market value. This difference between the manager's perceived valuation of the equity-based compensation and the actual market value is the deadweight loss to the firm. Since the company could have sold the equity-based instrument in the market to diversified investors and receive the full market value, it is effectively destroying value. Meulbroek (2001) acknowledges the fact that firms face a tension between incentive alignment and portfolio diversification. The optimal trade off between costs and benefits differs from firm to firm, but in every case there is a deadweight loss. Meulbroek's research shows that this deadweight loss is greatest for managers of high volatility firms (such

[7] See http://aflcio.org/paywatch

as internet or technology firms) who hold a substantial part of their portfolio in the company's equity instruments. For instance, a completely undiversified manager of an Internet firm will value his stock options at only 53 percent of the market value, whereas a completely undiversified NYSE firm manager values his stock options at 70 percent of market value.[8] Since Meulbroek is the only researcher providing empirical evidence on the deadweight loss, we cannot automatically assume that her finding constitutes sufficient supporting evidence for the theory. However, given the validity of Markowitz's efficiency frontier, the intuitively sensible conclusion drawn from the portfolio and stock-option theory, and the robustness of Meulbroek's results, it is reasonable to regard Meulbroek's theory as being valid.

3.3. The Timing Of Eso Awards

Although the awarding of ESOs is not always the choice of management itself, it is widely accepted that management always has at least some influence on the awards. Stock options may allow managers to convert private information into hard cash through insider trading transactions. Management is therefore in a unique position to manipulate the timing of the awards. Since nearly all ESOs are struck as a function of the share price on the day of the award, it is beneficial for management to opportunistically award stock options just prior to issuance of positive news (Yermack, 1997). At the same time, stock options may allow managers to convert private information into hard cash through insider trading transactions. A recent study by Narayana and Seyhun (2005) indicates that some firms are attempting to influence the grant date and find significant abnormal stock return reversals around the grant date suggesting that some firms are setting the grant date by picking a date in the past with a lower stock price compared to that on the decision date. Carpenter and Remmers (2001) also find that managers exploit inside information to time their option exercises.

Alternatively, management can time the announcement of bad news to coincide with the scheduled issuance of stock options, thereby effectively lowering the strike price of their options. Yermack's study focuses on the good timing of the unscheduled award of ESOs and finds that companies making unscheduled awards to their CEO outperform the market by more than 2 percent over a period of 50 trading days. Based on these results, Yermack argues that ESOs are awarded to align long-term interests of management and shareholders, but that the role of the managers in the process remains complex. He argues that the 2 percent outperformance has little to do with managerial skills, efforts, or performance, but rather with the remarkably good timing of the awards just prior to the positive news. Yermack tests various hypotheses against his findings, but finds none that contradicts his results. Yermack's finding is confirmed by Aboody and Kasznik (2000), who conduct their research from an opposite angle. Where Yermack focuses on the timing of unscheduled ESO awards just prior to good news, Aboody and Kasznik focus on opportunistic disclosure of bad news just prior to the scheduled award of ESOs, which results in the same thing: management receives stock options struck at a relatively low price. While they argue that executives manage shareholder expectations and advocate the timing of ESO to be changed to directly follow earning announcements, they hasten to say that management's activity does not necessarily affect shareholders' wealth. The board of directors might for instance allow the disclosure strategy as an implicit form of incentive compensation (Aboody & Kasznik, 2000).

3.4 Evidence Against Incentive Alignment

DeFusco, Zorn, and Johnson (1991) make an interesting observation that contradicts agency theory — they find that an increase in stock options is accompanied by a significant decline in research and development (R&D) expenditures, and an increase in selling, general and administrative expenses (SG&A). A decrease in R&D would suggest an attempt to boost short term earnings at the expense of long-term growth, whereas an increase in SG&A would suggest decreased efficiency. Bens, Nagra and Wong (2002) suggest that managers cut research and development expenditures to fund share repurchases for option plans so as to avoid EPS dilution. Besides, the costs of stock options for shareholders and the firm are not adequately reported in a company's financial statements (Matsunaga, 1995).

3.5. The Repricing Of Stock Options

As shown before, management can influence its own compensation package by adjusting the composition of the remuneration package, adjusting the dividend policy, or by opportunistically timing the issuance of bad news or stock options. Repricing is perhaps the most obvious and direct method to manipulate the value of stock options. Repricing is the act of changing the strike price of the ESO (or canceling the ESO and reissuing a new option) to a level that, according to proxy statements, better reflects current market conditions. A repricing typically occurs when market conditions have, in view of the board of directors, artificially depressed the market price of the common stock for a protracted period, so that outstanding options are significantly out-of-the-money for reasons not related to the company's performance. Both in theory and practice, there are multiple reasons for companies to reprice stock options. One reason might be that the loss in option

[8] The above sheds an interesting light on insider share dealings; an undiversified Internet manager can truly believe and announce that his firm is undervalued (by less than 47 percent) and sell part of his shares to diversify and still benefit.

value might indeed have resulted from poor market or industry performance. In other words, the recent underperformance of the company was solely due to factors outside managerial control and therefore based on chance. If we assume a normal distribution of chance, and therefore of under- or outperformance, why would a company issue ESOs (which are solely based on share-price performance) as a form of performance-based compensation? When issuing ESOs, managers should realize they are subjected to the market's mercy, for good or bad. Further arguments against the above-presented defense of repricing is given by the fact that, although chance can in fact work both ways, strike prices are rarely, if indeed ever, raised to reflect artificially inflated share prices (Chance, Kumar, & Todd, 2000).

A second reason is presented by Chance et al. (2000), who state that companies reprice stock options to maintain managerial talent. As indicated before, a prime benefit of stock options is the retention of key managerial talent; however, when they are far out-of-the-money, stock options are worthless and therefore offer no incentive for the managers to stay at the firm. By repricing, the initial benefits and rationale of the stock options are restored and management in effect receives a second chance to set things straight.

Nevertheless, this argument is limited in that it assumes the existence of options and ignores the fact that restricted stock or other forms of deferred compensation could be equally or more effective as a retention device. For example, tenure based restricted stock could have the same expected retention value as an equivalent dollar value of options, but with less risk. Another study by Gilson and Vetsuypens (1993) points to outside pressure. With stock options far out-of-the-money, management will become too entrenched and might consequently be induced to take excessive risks in a desperate attempt to create a payoff from the options. Excessive risk taking is ultimately always at the cost of the bondholders and creditors, and Gilson and Vetsuypens therefore argue that firms in financial distress might be persuaded by creditors to lower the strike price to dissuade managers from taking excessive risks.

In conclusion, since resetting the strike price of ESOs is (if the share price is low enough) effectively nothing more than discarding worthless options and issuing new ones, the same rationale applies to repricing as to issuing options in the first place. This view is confirmed by research stating that repricing is most likely to occur within firms with substantial agency problems.

3.6. The Loss Of Tax Reductions

The flipside of the aforementioned higher accounting profits is the loss of tax reductions. Although higher accounting profits should be considered irrelevant and meaningless from a shareholdervalue perspective, tax reductions translate directly into a reduction in cash outflow and therefore create shareholder value. As advocated in the academic and popular literature *"Cash is King"* (see, for example, Stewart, 1999).

However, we also know that managers still attach a high value to accounting earnings, and are eager to forego tax shields in favor of higher reported accounting earnings. Espahbodi et al. (2002) find some evidence that companies with tax-loss carry-forwards, consistent with the corporate-finance propositions, are more likely to award stock options. Since these companies cannot benefit immediately from the tax shield that cash compensation provides, the loss of the foregone tax shield is minimal. Espahbodi et al. (2002) investigate the share-price impact of proposals to recognize stock options on companies with tax-loss carry-forwards, and find a positive relation between the stockprice impact and the existence of tax-loss carry-forwards.

Their results can be interpreted as follows: after implementation of compulsory recognition of ESO costs, companies with tax loss carry-forwards are more likely to issue ESOs, since these companies cannot benefit fully from the tax-loss carryforwards. Espahbodi therefore concludes that the loss of tax reduction provides a barrier for firms to use ESOs, and conversely that when firms have tax-loss carry-forwards, the shift to ESOs does not sacrifice the tax shield, and thus becomes an incentive to issue ESOs.

3.7. Dilution

As mentioned before, dilution makes ESOs quite similar to warrants. Since the seller of the option is the company itself, the instruments have a dilutive effect from the moment the employee decides to exercise his stock options. A recent study by Eberhart (2005) demonstrates that recognizing employee stock options as warrants shows that shareholders assume a short position in these options when they are issued by the firm. A rise in the firm return volatility consequently benefits the employee stock option holders at the expense of the shareholders, ceteris paribus. In contrast, previous studies posit that volatility increases are directly beneficial to shareholders because levered equity is analogous to a call option on the underlying firm value. In contrast, however, some researchers argue that the direct benefit that levered shareholders receive from the rise in volatility is dampened by the direct detriment. As warrant holders, employee stock option owners are investors in the firm and their claim should be recognized as part of the firm's capital structure. This implies that the traditional debt–to–equity ratio measure can substantially overstate a firm's default risk. In other words, recognizing employee stock options as warrants reveals that the asset base is greater than the traditional firm value definition implies, and so the firm's default risk is lower than the traditional debt–to–equity ratio implies.

3.8. Executives' And Lower Level Employees' Understanding Of Stock Options

Employees' thoughts about their company's stock and stock options are subject to behavioural biases. Benartzi (2001), for example, provides evidence that employees excessively extrapolate past performance when deciding about company stock holdings in their 401(k) plans. This seems to be a suboptimal portfolio choice given their large human capital investment in the firm implying that some individuals do not understand the expected distribution of stock prices. A recent study by Bergman and Jenter (2004) shows that firms use broad-based options when employees are likely to be excessively optimistic about their company's stock, and when employees are likely to have a strict preference for options over stock. They find that employees are likely to rely on heuristics and to value options on the basis of their own or their associates' past experience with option payoffs. The most obvious example in which employees are unable to value options based on observed stock prices is that of a pre-IPO firm in which company equity is not yet traded. Even for firms with publicly traded equity, option valuation is sufficiently complex to exceed the abilities of most employees[9].

Hall and Liebman (1998) find that stock options are poorly understood. Stock options are not transferable and the exercise decision is made by executives who can influence stock prices themselves. Stock option plans easily get the approval of non-executive board members, without a deep understanding of the complex nature of stock options and the incentives they create.

3.9. Dividend policy

As we mentioned before when we discussed the advantages of ESOs, ESOs can mitigate the liquidity problems of a firm, where liquidity problems are associated with low dividend payments. However, as observed by various researchers (most notably DeFusco et al., 1991, and Lambert et al., 1989), this hypothesis suffers from the internal causality that ESOs can cause lower dividends since ESOs are not dividend protected. An opportunistic manager might therefore be inclined to lower the firm's dividend payout to protect the value of his options. Prior research such as that by Lambert et al. and DeFusco et al. finds a negative relation between ESOs and dividends, which is primarily explained by the liquidity-restraint hypothesis.

However, Kahle (2002) partly explains the results by arguing instead that the lower dividends are actually caused by ESOs and argues that the excessive cash is returned to shareholders via share repurchases. Her starting point is studied by Vermaelen (1981) and Dann (1981) who both find abnormal returns of 3 to 4 percent at the announcement of a repurchase program. The two commonly accepted explanations of the abnormal returns are the signaling theory and the free cash-flow theory (Kahle, 2002). The two theories still apply, but the increase in repurchases since the early 1990s remain unexplained. Kahle, however, finds that companies are more likely to repurchase if the number of outstanding stock options is high compared to outstanding shares or when many options have recently been exercised.

Furthermore, her study shows that companies decide to distribute cash to the shareholders not by dividend payments but by share repurchases to protect the value of the executive stock options. From a corporate-finance standpoint, the repurchase has exactly the same result; from a practical standpoint the manager will destroy his option value by paying dividends, and enhance it by repurchasing shares. From a corporate-finance standpoint, the result of a dividend payout and a share buyback is identical. Moreover, according to Miller and Modigliani (1961), investors should be indifferent towards the firms' dividend policies, implying that investors can imitate a dividend payout by selling part of their shares.

However, the reason that managers are foregoing dividends in favor of share buybacks is an opportunistic one. The result is that managers can influence their personal pay package without adding significant value to the company and its investors.

3.10. The Use Of Esos As An Anti-Takeover Tool

Whereas ESOs are meant to mitigate agency problems, they can actually create agency problems as well. When a company has a large number of ESOs struck just out-of-the-money, a takeover premium can lift the share price above the strike price. The exercise of the options will not necessarily cause a huge increase in the total takeover price, since the exercise price paid by the option holders will remain within the company. It can, however, create a poison pill. A prerequisite of course has to be that the employee cannot sell his shares to the potential acquirers (Couwenberg and Smid, 2001). The available evidence on stock options as an anti-takeover mechanism is purely anecdotal, and academic theory in this area is sparse. With relatively low equity values and historically very low interest rates, a new era of hostile takeovers and corporate raiders could emerge — empirical research into this subject could indeed soon prove to be relevant and provide interesting results.

[9] Lambert and Larcker (2001) support this argument and report survey evidence showing that employees tend not to understand the basic economics of stock options and frequently value their options substantially above Black-Scholes values.

4. Suggested Alternatives

Stock options are the most widely used incentive tool in top- and middle management compensation. According to Rappaport (1999), they account for half of total top management pay, and 30 percent of middle management pay. Despite their current negative aftertaste that has been caused by the recent accounting scandals, the academic literature suggests that options do in fact provide incentives for management to deliver superior performance. However, the fact that stock options are the most widely used tool does not automatically mean that they are the best way to tie managerial pay to performance, as their prime goal is supposed to be. In fact, there are numerous alternatives to plain vanilla stock options[10], which, at least in theory, provide a far better link between pay and performance.

The reason these alternatives are hardly used lies in the anomalous accounting treatment of the plain vanilla options versus their alternatives — plain vanilla stock options are not recognized, whereas all the alternatives are. With the (at least presumed) importance of reported earnings, the plain vanilla stock option used to be an obvious choice for most firms. With upcoming accounting changes perhaps close at hand and the recent negative press about plain vanilla options, the playing field should be leveled. It is therefore worthwhile to investigate some of the alternatives to plain vanilla options in more detail.

4.1. Explicitly Tie Compensation To Unique Value Creation

In case after case, investors have seen executives reap extraordinary rewards tied to share price increases that had little to do with their actions and everything to do with factors beyond their control, such as movements of interest rates and changes in macroeconomic conditions. Since standard stock options do not differentiate between value created by external factors and individual performance, investors may be shortchanged and CEOs may be rewarded regardless of merit — as happened during the stock market run-up of the late 1990s — and top performing CEOs may be penalized if their tenure coincides with a bear market. Indeed, McKinsey research shows that from 1991 to 2000, market and industry factors drove about 70 percent of individual company returns, while company specific factors were responsible for only 30 percent. One way to home in on unique value creation would be to strip out the effect of factors that are beyond the executive's control and the return on equity expected by shareholders. What remains — reflecting improvements in performance or changes in expectations for which the executives were themselves responsible — should be compared with the achievements of their peers. In general, executives should be held accountable for their ability to meet their shareholders' expectations as defined by the cost of equity.

Moreover, they should be rewarded for any individual value creation and penalized for any individual value destruction. Indexed options are one tool for achieving this (see Johnson and Tian, 2000a). Unlike standard options, indexed options make it possible to benchmark an executive against a group of his peers. Of course, making the right selection of peers is crucial and in the few cases where indexed options have been employed for this purpose, their impact has been diluted by the use of a too lenient or broad definition of the peer group. Indexed stock options exist in different forms, but they all share the main principle that the underlying share price outperforms a certain benchmark to determine or create a payoff.

The most commonly used form of indexed stock options is where the option payoff is based on the outperformance of the underlying share price over a certain index, or is zero when the underlying share price underperforms the index. The logic for indexed stock options is obvious; the option only creates a payoff when the underlying share price outperforms a relevant benchmark, ensuring that only superior performance will be rewarded. Among the many criticisms stock options received recently (aside from the sheer magnitude of some of the grants), one of the main ones was that stock options rewarded sub-par performances.

The 1990s saw booming share prices for virtually every company, even the ones in dire straits. Individual share prices rose on the back of rising equity markets in general, creating an undeserved payoff of stock options. By indexing, the rise in the underlying share price is adjusted by the rise in the index. For instance, if the underlying share price rises 25 percent and the relevant benchmark rises 20 percent, the payoff is 5 percent. Rappaport (1999) points out a limitation to indexed stock options, namely that indexed stock options have a lower value than plain vanilla stock options due to their comparative nature — the holder is in fact long the underlying share and short the index[11]. Rappaport therefore advocates either lowering the strike price or awarding more options. Awarding more options has the drawback of increased dilution, whereas a lower strike price might reward a sub-par performance and the option's delta is still lower than that of plain vanilla options.

[10] A plain vanilla option is a normal option with no special or unusual features. Most stock option plans make use of such plain vanilla options.

[11] For more elaborate pricing methods of indexed stock options, refer to Johnson and Tian (2000a, 2000b).

Hall and Murphy (2003) argue that the infrequent use of indexed options reflects two factors. First, as discussed further in the next section, grants of indexed options must be expensed in accounting statements (resulting in smaller reported income), while traditional options are not expensed. Second, traditional options are much more likely than indexed options to end up with a stock price that exceeds the exercise price.

For example, the probability that a traditional option is in the money after ten years is approximately 80 percent. In contrast, the probability that an indexed option is in the money after ten years is significantly less than 50 percent, because stock returns are skewed to the right (since the minimum return is minus 100 percent but the maximum return is unbounded), and therefore less than half of the firms in an index will have returns that exceed the average.

Thus, indexing reduces the company's cost of granting an option, but it reduces the executive's value even more because riskaverse executives attach very low values to options likely to expire worthless. Therefore, to deliver the same value to the executive, it costs the company more to grant indexed options rather than traditional options. However, an analysis of indexed options based on Hall and Murphy's (2002) methodology shows that indexed options dominate traditional options only if the indexed options are granted with exercise prices that are well below market value at the time of grant, to offset the major disadvantage of reduced payout probabilities.

4.2. Minimize Incentives To Alter The Company's Risk Profile

Investors have also discovered that executives of the companies whose shares they own have ample opportunity to affect shares prices by managing in ways that aren't necessarily in investors' best interests. Increasing the financial leverage of a company or the degree of business risk it bears are prime examples.

Consider the situation of a CEO who holds a substantial number of options that are in effect worthless because the share price has fallen significantly below the strike price at which the executives can exercise them. If there is little likelihood that the share price will rise sufficiently, the CEO might well consider undertaking risky acquisitions or new projects that could increase the expected volatility of the stock price and restore his options' value. All approaches to valuing stock options agree that increasing the volatility of the underlying stock price boosts an option's value. The CEO faces limited downside risk, the options were worthless to being with, and no matter how far the stock might plunge, they can't become any more so. He has nothing to lose and everything to gain from greater volatility – which increases the potential magnitude of downward share price movements and may thus introduce a degree of risk that many investor groups would neither anticipate nor welcome. To guard against such circumstances, the board's best response might be to reduce the weight of stock options in the CEO's compensation.

4.3. Favor The Grant Of Restricted Stock Over Stock Options

Restricted stock has several advantages over stock options in providing incentives to top executives. Requiring top executives to hold company stock provides relatively stable incentives regardless of the stock price, whereas with stock options the incentive value of options depends on the market price of the stock relative to the exercise price.

In particular, options where the market price is well above the exercise price provide incentives similar to those provided by stock holdings, but options lose incentive value (and retention value) once the stock price falls sufficiently below the exercise price that the executive perceives little chance that they will ever provide a significant payoff. Optiongranting companies with "underwater options" are under constant pressure to lower the exercise price on outstanding options or to grant additional options to effectively replace the underwater ones (see, for example, Hall and Knox, 2002). The difficult pressures resulting from the underwater-options problem are avoided by granting restricted stocks. Indexed stock options offer one way to distinguish between value created by external forces and value arising from individual performance; nevertheless, the solution they offer is only partial. Indexed options can still create incentives for executives to pursue interests that are unlikely to maximize shareholder value. One answer would be to replace stock options with restricted stock, granted under conditions related to executive tenure and performance. Jenter (2001) and Hall and Murphy (2002) argue that restricted stock dominates options with non-zero exercise prices as an incentive mechanism[12].

By requiring executives to invest a minimum proportion of their wealth or a multiple of their salaries in the stock of the companies they run, boards can ensure that they will care about a sustained drop

[12] Lazear (1999) and Murphy (1999) have shown that other forms of deferred compensation that do not expose employees to stock price risk are a more efficient means of providing retention incentives. See Lambert and Larcker (2002) for a counter-perspective. Hall and Liebman (1998) find that stock options are a less visible means of increasing executive pay "in the face of public opposition to high pay levels" especially because stock option grants are not expensed for financial reporting purposes (Matsunanga, 1995). Bertrand and Mullainathan (2001) show that CEO pay responds as much to luck as to general performance. They interpret their results as evidence in support of managers benefiting at the expense of shareholders. Bebchuk et al. (2002) argue that the absence of indexed options that filter out general market increases and the near uniform use of at-the-money options in compensation packages of all firms can cause CEOs to receive excessive pay.

in share price. Many companies, including Citigroup and Bank One, have instituted such rules.

Granting restricted stock rather than options affects managerial incentives to engage in risky investments. An executive holding out-of-the-money options, where the exercise price is above the current market price, will have incentives to undertake riskier investments than will an executive holding in-the-money options; in contrast, investment incentives are roughly independent of stock prices for executive holding stock (unless the price is sufficiently low that the risk from bad outcomes is shifted to debtholders).[13]

In addition, executives holding restricted stock rather than options have better incentives to pursue an appropriate dividend policy. Since options reward only stock-price appreciation and not total shareholder returns (which include dividends), executives holding options have strong incentives to avoid dividends and to favor share repurchases — and several studies have found evidence that managers have responded to this incentive (see, for example, Lambert, Lanen and Larcker, 1989; Lewellen, Loderer and Martin, 1987; Jolls, 2002; Fenn and Liang, 2002).

4.4. Restrict The Timing Of Stock Sales

Boards can also move to restrict the sale of a significant proportion of stock awards over a period of two years after the end of an executive's tenure. This would ensure that senior executives focus on the creation of long-term value and not on short-lived bumps in the stock price. This would also deter CEOs from leaving unpleasant surprises for their successors and would create greater incentives for them to orchestrate or facilitate their replacement by strong successors.

4.5. Limit The Potential For Hedging Strategies

Senior executives have many ways to hedge the holdings in their company's shares. From a senior executive's perspective this may seem sensible as a way to ensure portfolio diversification; needless to say, it poses a danger for shareholders because it can limit the executive's real exposure to the results of his decisions without them knowing it. Executives could carry out a hedging strategy by taking short positions in other companies in the same sector, thus offsetting a portion of their holdings. Given that there are many ways to hedge, it is difficult to make it impossible for executives to hedge themselves completely against a drop in the value of their own companies. To provide the greatest transparency, boards might consider asking senior executives to disclose their same-industry holdings, or indeed the entirety of their investment activity, on a regular basis as a deterrent to egregious hedging practices. Hall and Murphy (2003) find no evidence that would suggest that this practice is widespread.

Although executives sometimes hedge the risk of their unrestricted stock holdings, it is more difficult to hedge option risk because executives are legally precluded from shorting their company stock, trading their options or "restricted stock" (stock that cannot be freely sold by the executives), or pledging these securities as collateral. Moreover, Schizer (2000) documents that significant tax disadvantages would result from hedging restricted stock or options. Finally, even if some top executives have hedged some of their option holdings, such schemes are not available to lower level managers and employees who receive 90 percent of stock options granted.

4.6. Other Alternatives

There is some evidence that 1) plain vanilla executive options do not provide the right incentives, at least from a theoretical perspective[14], and that 2) such option schemes are too generous. Therefore, numerous attempts have been made to extend the traditional approach of executive compensation. Besides awarding restricted stocks or index options instead of stock options there are other alternatives that managers can consider. Johnson and Tian (2000b) quantify the incentives of different executive option plans by measuring and comparing their sensitivity to changes in stock price, to changes in volatility, and to changes in dividend yields. In their study, they find large differences in non-traditional options compared to plain vanilla stock options, both in their values and in the incentives they provide to the management. Depending on a firm's strategic orientation, these incentives play an important role. For instance, Guay (1999) finds that firms with greater investment opportunities structure executive compensation to encourage risk-taking.

4.6.1. Knock-in Barrier Options

Knock-in barrier options are awarded with an out-of-the-money barrier level and will only vest once the barrier level is breached. Notwithstanding the fact that the barrier level is out-of-the money, the strike price can be set at any desired level.

[13] Hirshleifer and Suh (1992) argue that option plans (or other plans with "convex" payouts) help mitigate the effects of executive risk aversion by giving managers incentives to adopt rather than avoid risky projects. However, it is not obvious why the optimal "mitigation" should depend on whether options are in or out of the money.

[14] Interviews with company directors provided by Hall and Liebman (1998) suggest that the incentives of stock options are not well understood, either by the boards that grant them or by executives who obtain these options.

4.6.2. Step-up Options

An alternative to regular stock options is the so-called step-up option, where the strike price of the options is increased every year by a fixed amount or percentage. The rationale for step-up options is that they circumvent the common complaint for standard options that their payoff is high because on average equities rise. With the annual increase in the option's strike price, share returns need to exceed their historic benchmarks in order for the option to pay off.

4.6.3. Trend Options

Leippold and Syz (2005) suggest the use of a so-called simple trend option, whose payoff is linked to the trend of a stock price or an index, making the timing of the decision less relevant.

4.6.4. Other Exotics

The alternatives described above can be combined in any desired way to create particular incentive alignments for particular situations. Depending on the situation at hand, there are a variety of mixed compensation methods that could be engineered this way. Such nontraditional methods include repriceable options (see, e.g., Brenner, Sundaram and Yermack (2000)) and reload options (see, e.g., Hemmer, Matsunaga and Shevlin (1998)). Due to the sheer number of possible combinations, however, a detailed discussion of all varieties is merely impossible.

4.6.5. Accounting Earnings

Under an accounting earnings compensation plan, the top-management compensation is directly linked to the accounting earnings the company reports. As with plain vanilla stock options, and other performance-based compensation plans, the stated objective is to align the incentives between top management and shareholders. The popularity of accounting earnings is, according to Sloan (1993), explained by the fact that accounting numbers are under management's influence, contrary to stock options, which depend on the uncontrollable noise in equity markets to determine their value. The controllability of the accounting numbers is, given the current environment of accounting scandals, also cited as the main drawback to using accounting earnings. Watts and Zimmerman (1986) focus on the increased incentive for opportunistic behavior provided by accounting-based compensation. Sloan (1993) finds that accounting-based compensation helps shield executives' pay from market-wide fluctuations and that accounting based compensation tracks firm specific performance better than plain vanilla stock options. Sloan's findings imply that CEO salaries and bonuses are more sensitive to earnings when stock returns have a higher correlation with market-wide movements in equity values, earnings have a higher association with market-wide movements in equity values, and earnings have a less positive association with the market-wide equity values.

4.6.6. Shareholder-value-added (SVA) Bonuses

Plain vanilla stock options are considered by boards of directors and shareholders as tools that successfully align incentives for both CEOs and unit managers (Rappaport, 1999). However, almost all alternatives suffer from the same restriction: the eventual payoff of the instruments is based on the firm's share price, and, therefore, total firm performance. Since individual business units are essentially private companies falling under one corporate umbrella, inconsistent pay-for-performance links are the logical consequence. A superior method for unit managers would therefore be to tie compensation to the performance of the specific business unit. According to Rappaport (1999), earnings, return-on-invested-capital (ROIC) and return-onequity (ROE) are often used. However, all of them have critical shortcomings. Rappaport (1999), therefore, advocates the superior shareholder-value-added (SVA) approach which measures the incremental value of a business unit's operations over its invested capital. The SVA approach attaches a value to the change in future cash flows of the business unit, and applies standard discounted cash-flow techniques to determine the value of those cash flows. In a next step, it compares the expected future cash flows from operations with the current and anticipated investments. The advantages are well documented: the approach uses cash flows instead of the manipulable accounting numbers; the business unit's SVA should in fact translate immediately into the overall share price and, therefore, the shareholder's value; and the SVA approach takes all the important value drivers such as cost of capital, return on invested capital, capital structure, growth, sheer size of invested capital (Stewart, 1999) into account. Ittner and Larcker (2001) evaluate the abundantly available literature on economic-value-added (EVA) and its relation with market measures such as market value and shareholder return.[15] From Anctil (1996), Rogerson (1997), and Riechelstein (1997), Ittner and Larcker conclude that the use of residual income measures, such as EVA, as a compensation determinant can ensure goal congruence between shareholders and managers. However, according to Ittner and Larcker, the literature is inconclusive as to whether divisional EVA provides a good proxy for share price performance. Zimmerman (1997) argues that divisional EVA measures can be highly misleading indicators of value creation and may provide wrong incentives, even though corporate EVA tracks changes in the share price. The stock market seems to disagree with Zimmerman: Wallace (1997) finds

[15] EVA is the more common term for what Rappaport calls SVA. EVA was introduced by J.M. Stern and G.B. Stewart III and is a registered trademark of Stern Stewart.

some weak evidence that the stock market responds positively to the adoption of residual income-based compensation plans. Moreover, the long-term effects are clear: residual income-based firms decrease new investments, increase payouts to shareholders, and utilize assets more intensively, leading to greater residual income (Wallace, 1997). These results prompt Ittner and Larcker (2001) to point out the limitations applicable to all residual income-based studies: the information that compensation is based on, namely the management-accounting data, differs significantly from the data researchers use, namely the publicly available financial-accounting data. Changes to every individual statement are required to make the data consistent — an error-prone activity.

4.6.7. Phantom Equity

Phantom equity is in essence a cash-settled stock option. Phantom stock is simply a promise to pay a bonus in the form of the equivalent of either the value of company shares or the increase in that value over a period of time. For instance, a company could promise Mary, its new employee, that it would pay her a bonus every five years equal to the increase in the equity value of the firm times some percentage of total payroll at that point. Or it could promise to pay her an amount equal to the value of a fixed number of shares set at the time the promise is made. Other equity or allocation formulas could be used as well. The taxation of the bonus would be much like any other cash bonus – it is taxed as ordinary income at the time it is received. A stock appreciation right (SAR) is much like phantom stock, except it provides the right to the monetary equivalent of the increase in the value of a specified number of shares over a specified period of time. As with phantom stock, this is normally paid out in cash, but it could be paid in shares. SARs often can be exercised any time after they vest. SARs are often granted in tandem with stock options to help finance the purchase of the options and/or pay tax if any is due upon exercise of the options; these SARs are sometimes called "tandem SARs." One of the great advantages of these plans is their flexibility. But that flexibility is also their greatest challenge. Because they can be designed in so many ways, many decisions need to be made about such issues as who gets how much, vesting rules, liquidity concerns, restrictions on selling shares (when awards are settled in shares), eligibility, rights to interim distributions of earnings, and rights to participate in corporate governance (if any).

5. Conclusions

Continuing accounting scandals have given companies an opportunity to rethink stock options and their role in aligning management and shareholder interests. The research surveyed in this study has been conducted over different timeframes, employs different methodologies, focuses on many areas, and is set against various backgrounds. Consequently, the findings are often contradictory, but each has its intrinsic merits. We have noted the advantages and disadvantages of the different research results.

The academic world tends to agree that stock options improve the performance of a company, provided that the stock-option plans are set in the right manner. The widespread use of stock options indicates that the professional world also believes that the advantages outweigh the disadvantages. However, in the near future, with the probable disappearance of the anomalous accounting treatment of stock options, we might see the curtailment of stock options in favor of one of the alternatives. The alternatives we described in this survey are the most important competitors to the granting of plain vanilla stock options, but the list is by no means exhaustive. On the contrary, the imminent accounting changes are bound to trigger a revolution in compensation policies. The extraordinary combination of the loss of nonrecognition of stock options, the collapsing equity markets, the escalating accounting scandals, and the accompanying negative aura of stock options will provide an extremely fertile ground for innovative and we hope, effective compensation plans.

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