What Contributes to Executive Pay for Performance

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Abstract:

Executive compensation packages and the incentives they provide have been receiving increased scrutiny due to the increasing empirical evidence that there is, at best, a weak relationship between pay and performance. In this study we attempt to shed more light onto this relationship by more thoroughly examining the pay-performance relationship than previous studies. Using more specific definitions of both compensation and performance than in previous studies, we document a degree of pay-for-performance with respect to total compensation. Interestingly, we find that this relationship is most significantly related to accounting-based measures of performance and compensation from bonuses and, to a much lesser extent, equity-based compensation. Because conventional wisdom suggests a major role for equity-based compensation in linking pay with performance, we go beyond the existing literature to ensure the robustness of these results to different ways of determining the value of executive stock options.

1. Introduction:

For a large part of the past two decades, executive compensation has been capturing investors' attention because of both its size and the apparent disconnect between the level of compensation and firm performance. Discussions regarding the evidence that executive compensation is more than 400 times that of the average worker within their firm abound and generate concerns regarding the true value being generated by these individuals. Warren Buffet summed up the current view on executive compensation well in his 2004 annual letter to Berkshire Hathaway shareholders: "In judging whether Corporate America is serious about reforming itself, CEO pay remains the acid test. To date, the results are not encouraging."

At the heart of the debate surrounding executive compensation is the apparently unfulfilled belief that executive compensation packages should be designed to address the principal-agent problem (e.g., Jensen and Meckling (1976)) by providing executives with incentives that align executives' interests (i.e., their compensation) with the interests of the firm's major stakeholders (e.g., its shareholders). Consistent with this belief, the Securities and Exchange Commission (SEC) updated its regulations regarding executive compensation in 1993 and again in 2007 to more clearly focus executive compensation packages on pay for performance. Despite the commitment of the SEC and its counterparts around the world, most academic research continues to find, at most, a weak relationship between firm performance and executive compensation (for discussions see Murphy (1999), Tosi et al. (2000), Core, Guay and Larker (2003) and Bebchuk and Fried (2004)).

The goal of this paper is to provide a new perspective on the pay-for-performance relationship for the CEO as well as the other four most highly paid executives. Although a multitude of past studies have considered this issue, they have generally focused on total compensation or the equity-based portion of compensation for the CEO. We argue that these measures may not completely capture the incentives as viewed by the executives. To more accurately determine the relationship between compensation and performance, we start by

considering not only the standard definition of compensation considered in existing studies (i.e., the total executive compensation disclosed at the end of the fiscal year), but also the value of each of the individual components of executive compensation (not just for the CEO) including both "non-contingent" parts of executive compensation such as salary and other sources of annual income, and "contingent" compensation[1] such as bonuses, options, and both existing and future shareholdings (including the associated dividend income)[2]. Going beyond just extending the definition of compensation, we pay special attention to options because of the significant role played by equity-based compensation in current compensation contracts. Since options, unlike bonuses, are not paid in cash, there are concerns with respect to how they are being valued: Do the values disclosed in corporate proxy statements adequately capture the true value of executive stock options as perceived and ultimately realized by the executives? To address this problem, we consider both the theoretical value that was applied to the executive stock options at granting (e.g., Black and Scholes (1973), Hull and White (2002 and 2004) and Hall and Murphy (2002)) and the actual compensation realized from the exercising of executive stock options. Going beyond our more detailed examination of the components of compensation, we also consider a broader set of performance measures including both accounting and market-based measures of firm performance.

Our contribution is therefore to more accurately examine the pay-performance relationship for executives (not just the CEO) by considering: i) the role of different components of compensation in this relationship, ii) the potential impact of considering the actual value realized by executives from exercising their options rather than the disclosed value used in

[1] Contingent compensation is compensation the level of which depends on the successful attainment of different targets.

[2] Kaplan and Rauh (2008) also recognize the fact that disclosed compensation misses certain aspects of executive total compensation. They include the value of share sales and option exercises in a given year on top of the disclosed total compensation.

existing studies[3] and iii) the influence on the results of using different measures of performance, both accounting- and market-based. By more accurately estimating the value received by all of the top five executives from each of the components of their compensation and its relationship to different types of performance, we hope to more accurately estimate the degree of pay-for-performance, where it originates and/or where it fails. For example, does the fact that bonuses (equity-based compensation) are supposed to reward short-term (long-term) performance and that these have different weightings in each executive's compensation package impact overall pay-performance sensitivities? Does the difference between the true, realized value and disclosed values for equity-based compensation help explain this relationship? Do these relationships depend on the measure of performance and forms of internal corporate governance? And, finally, what implications do these findings have for academics, practicing managers and regulators?

We examine the relationship between the different components of executive compensation and firm performance over the past seven years for the top five executives at the 60 largest Canadian firms listed on the Toronto Stock Exchange as of January 2007. Although the majority of existing studies focus on compensation policies in the U.S., our choice of Canadian firms provides a useful benchmark for many reasons. First, compensation at the largest Canadian firms is similar to that at comparable U.S. firms in both level and composition (e.g., Southam and Sapp (2009)). Second, many of these firms are cross-listed in the U.S. so they provide compensation packages which are designed to both compete with those offered by top U.S. firms and comply with Canadian and U.S. disclosure and tax laws implying that the conclusions should be robust to regulatory regimes in both countries. Finally, there have been fewer reported abuses

[3] Examining the relationship between the theoretical and realized value of options is also becoming increasingly important as regulations regarding option valuation are changing. Recent changes in the rules of the Financial Accounting Standards Board (in particular FASB 123R) require the expensing of options at their "fair market value". As a result, our study provides a unique perspective into the effect of these changes on total compensation and the pay-performance relationship that are relevant for academics, investors and regulators.

of options (e.g., backdating and repricing) in Canada which is important for evaluating the role of options and their valuation in pay-for-performance tests.

As in previous studies, we find that firms make significant use of cash bonuses and equity-based compensation in their executive compensation packages[4] (frequently accounting for over 50% of total executive compensation). Using cross-sectional time series regressions controlling for factors known to influence executive compensation, we find that the aggregate compensation for the CEOs at our firms is weakly consistent with pay-for-performance but the pay-performance relationship is insignificant for the other top five executives. Breaking this result down by the individual components of compensation, we find that the majority of this pay-performance sensitivity is related to the bonus with weak additional evidence of pay-for-performance with respect to the disclosed value for options.

Because of the significant role played by options in the size of total compensation, the widespread belief that options are among the best means to align pay with performance and the weak relationship between performance and option-based compensation, we examine the robustness of our results to different methods of valuing executive stock options (ESOs). Our analysis focuses on the theoretical value applied at granting (i.e., the disclosed value) and the value obtained upon exercising the options (i.e., the actual value realized by the executive). The pay-performance relationship should be between performance and the realized value of stock options (the *actual* incentives from the perspective of the executive and not necessarily the theoretical value). Since we find very significant differences in the two values, we examine the differences in the relationships between the theoretical values, actual values and firm performance. Despite the significant differences between these values – a significant undervaluation by the disclosed value for ESOs – we find that neither using the standard nor an

[4] As in previous studies using Canadian data, we find the percentage of equity-based compensation used in Canadian executive compensation is slightly lower and the percentage of bonus being slightly higher than for their peers in the U.S. (e.g., Murphy (1999), Zhou (2000) and Southam and Sapp (2009)).

updated, more realistic option valuation methodology improves the evidence of pay for performance.

Overall our results suggest that there is weak evidence of pay for performance in our set of firms. Interestingly, the pay-performance sensitivity was found to be related to the bonus (i.e., short-term reward for performance) with only weak evidence of pay-performance sensitivity that can be associated with the option-based compensation. In our sample we find a degree of pay-performance sensitivity with respect to total compensation because Canadian firms use a larger percentage of bonus in their overall compensation package than U.S. firms. This is interesting because our sample of Canadian firms is most similar to moderately sized U.S. firms where pay-performance sensitivity has not been found in the past. Extending our conclusions with respect to the role of differences in the composition of compensation to international studies, our results suggest that at firms where more compensation is equity-based (salary-based) as in U.S. (European) contexts, it is not surprising that we do not find strong evidence of pay for performance. It is also worth noting that our results of pay-performance sensitivity are only consistently found using an accounting based measure of performance, the return on assets (ROA), so our results highlight the important role of defining the relevant performance metrics.

The paper develops as follows. The next section motivates the hypotheses which we test in our analysis. Section three describes our data. Section four discusses our empirical tests and the results. The final section concludes.

2. Background:

One of the stated goals of the SEC guidelines on executive compensation introduced in 1993 and updated in 2006[5] was to strengthen the relationship between executive compensation and firm performance. Despite the almost universal acceptance of this principle, implementing

[5] Note: similar guidelines were adopted in Canada in 1993 and 2007.

effective pay for performance compensation packages has proven elusive[6] (for surveys see Murphy (1999), Tosi, Werner, Katz and Gomez-Mejia (2000) and Core, Guay and Larker (2003)). Theoretically-speaking, one can design contracts to align the incentives of shareholders and management to ensure that pay is correlated with performance (this is the premise of the "optimal contracting" approach to executive compensation discussed in Murphy (1999)). A potential reason for the difficulty in implementing pay-for-performance in practice is that executive compensation contracts are negotiated and enforced by individuals with incentives that may differ from those of the shareholders (as discussed in the "managerial power" approach proposed by Bebchuk, Fried and Walker (2002) and Bebchuk and Fried (2004)). Although both of these approaches have intuitive appeal, the truth likely lies somewhere in the middle (e.g., Fama (1990), Zingales (1998) and Sapp, Cotte and Bryant (2008)).

The problems in designing executive compensation packages can therefore be traced to several competing forces. The first relates to senior management's self-interests – performance-based pay is more uncertain (e.g., Hill and Phan (1991) and Gray and Cannella (1997)), and therefore generally less desirable to managers who already have a significant part of their human capital tied to the company's future (e.g., Muelbroek (2001)). Shareholders, on the other hand, want executive compensation to have a level of risk related to firm performance so executive compensation moves with the value of their investment. To balance these opposing forces, corporations divide executive compensation into a "contingent" and "non-contingent" portion with each component exposing executives to different types and levels of risk (e.g., Daily, Johnson, Ellstrand and Dalton (1998)). Contingent compensation (e.g., options, other types of long-term incentive plans, bonus etc.) induces uncertainty related to firm performance (e.g., Gray and Cannella (1997)), whereas non-contingent compensation (e.g., salary, other sources of annual income, pension etc.) provides a stable stream of income (e.g., Tosi and Gomez-Mejia (1994)).

[6] An interesting debate on the topic can be found in Kaplan (2008) and the corresponding responses in Bogle (2008) and Walsh (2008).

2.1 Factors Influencing Pay-Performance Sensitivities

The most obvious means of aligning executives' incentives with those of the shareholders is to increase the use of contingent or equity-based compensation. Although there is only weak evidence of a relationship between pay and performance, existing studies have found that pay-performance sensitivities are driven primarily by the use of stock options and restricted shares (e.g., Jensen and Murphy (1990), Hall and Leibman (1998)). They find that 95% of the estimated pay-performance sensitivity for CEOs in manufacturing companies reflects stock options (64%) and restricted stock (31%). Pay-performance sensitivities vary across industries and firm size with the highest degree of pay-performance sensitivity being with large S&P 500 companies (e.g., Bryan, Hwang and Lilien (2000)).

Although less frequently discussed, an interesting aspect of executive compensation is how pay-performance sensitivity differs across the levels of management. Tournament theory (first introduced by Lazear and Rosen (1981)) suggests that the CEO should be paid more and have more performance-based pay to give the other executives an incentive to want the top position and the non-CEO executives' compensation should be less performance-dependent as their ability to influence the decision-making process is smaller. Consistent with this, recent research suggests that the CEOs at firms in industries where the CEO has little discretion such as utilities are paid less (e.g., Joskow, Rose and Wolfram (1996)) and that the CEO and other executives are paid differently – non-CEO managers receive lower levels of compensation and less equity-based compensation (e.g., Sapp (2007)).

Even though most firms in the U.S. use some form of equity-based compensation, especially options, it is used to a lesser degree outside of the U.S. (for a survey see Murphy (1999)). Of most relevance to our study is evidence that the use of options in Canada is growing, though still less than in the U.S. (e.g., Zhou (2000), Park, Nelson and Huson (2001) and Southam and Sapp (2009)), and depends on firm level characteristics, especially measures of internal corporate governance (e.g., Sapp (2007)) and measures of external corporate governance such as

cross-listing (e.g., Southam and Sapp (2009)). These findings are consistent with those from other countries where it has also been found that corporate governance plays a significant role in the compensation determination process – research suggests that weaker corporate governance leads to larger executive compensation, more generous equity-based compensation packages and less performance-related monitoring (for interesting discussions see Bebchuk, Fried and Walker (2002) and Bebchuk and Fried (2004)).

2.2 Executive Stock Options

Because of the increasing importance of equity-based compensation, both the SEC and FASB have recently updated their regulations regarding the valuation and disclosure of the valuation of this form of compensation. The principle goal of these regulations is to more accurately capture the true value of options to executives. In fact, the modifications to FASB 123 are designed to ensure that firms disclose the "fair value" of the options, adjusted for the "unique characteristics of the instrument". Capturing the true value of options to executives is complicated by the fact that the characteristics of executive stock options are different from those of standard options for which the valuation methodologies were developed (e.g., Rubinstein (1995) and Hall and Murphy (2002)). Executives, for example, cannot freely trade or sell their options, at least not right away, and they may be forced to forfeit their options if they leave the firm while their options are out-of-the-money. They are also forbidden from hedging the risks by short-selling company stock[7]. Despite its many well-documented short-comings, the Black-Scholes model remains the most commonly used method for valuing executive stock options in corporate proxy statements.

Because of the many concerns regarding the assumptions at the heart of the Black-Scholes model, researchers have developed models to correct for issues such as the early exercise and forfeiture of options, and executive's level of risk aversion (e.g., Hull and White (1988 and 2002)). Despite their different technical features, many of these models obtain very similar values

[7] Though this is not always the case in practice (e.g., Bettis, Bijack and Lemmon (2005)).

for executive stock options (e.g., Damodaran (2005)). As a consequence, it is not clear how much these extra assumptions and new methodologies improve the ability of the standard Black-Scholes (1973) model to accurately estimate the future potential value for executive stock options. This is especially relevant as many of the recent changes in our valuation models are related to the changes in the rules regarding the expensing of executive stock options (FASB 123R) which requires the valuations for executive stock options to more accurately capture their "true market value".

In theory the potential/theoretical value for executive stock options estimated at granting should consider all of these factors and therefore represent the "fair market value" (Note: we interpret this to mean the theoretical value should be equal to the realized value obtained upon exercising executive stock options discounted back to the time of granting). Although many researchers have proposed changes to the option valuation methodologies to more accurately capture some of these features of executive stock options, few have empirically compared the performance of the different models to the value realized by executives and subsequently to the weak pay-performance relationship found in existing studies[8].

2.3 Summary

The existing literature proposes a number of explanations for the weak pay-performance relationship which we investigate. First, the models used to describe the executive compensation design process suggest a potential role for corporate governance, especially managerial power in the pay-performance sensitivity. Consequently, we include such factors in our model to correct for their potential role in the pay-performance relationship. The literature suggests different

[8] One exception to this is Kaplan and Rauh (2008) who add to the disclosed compensation in a given year the value obtained by an executive from exercising options and selling shares. Since the value of options and restricted stock units had been valued and included in the executives' compensation in the year of granting, we feel this is double counting and may bias the results towards finding pay-for-performance – most individuals would exercise their options or sell their shares when the firm is doing well thereby increasing their compensation when the firm is doing well regardless of when the shares and options were granted. Consequently we address this concern in a slightly different manner to only capture this compensation once at the time of granting.

objectives for each of the components of compensation which would influence the pay-performance sensitivity and thus the sensitivity of total compensation to performance due to different weights for the components in the overall compensation packages. To better understand the sensitivity of each component of compensation, both together and alone, to performance. We also more carefully examine the value used for the option-based compensation in the pay-performance sensitivity – we examine the role of both the theoretical or disclosed value as well as the realized value for the options. Finally, we recognize the differences in incentives provided by different performance measures, so we consider a variety of the most commonly proposed performance metrics. Our analysis therefore more carefully considers the individual and aggregate components of compensation while correcting for the effects of known corporate governance factors in the pay-performance analysis.

3. Data:

We examine the levels of each component of compensation for each of the top five most highly compensated executives for the firms making up the TSX60 index (the 60 largest firms by market capitalization listed on the main Canadian stock exchange, the Toronto Stock Exchange) as of January 2007. The disclosure of the compensation of the top five executives has been mandatory in Canada since 1993. At that time, the Ontario Securities Commission (OSC) updated its regulations to be broadly consistent with those enacted by the Securities and Exchange Commission (SEC) earlier that year. Copies of the proxy statements in which this disclosure is made can be obtained through the System of Electronic Document Analysis and Retrieval (SEDAR). SEDAR is a comprehensive, on-line archive of securities documents filed by publicly traded companies in Canada (found at http://www.sedar.com). We use this information to obtain the salary, annual income, other annual income, bonus and LTIP (including information on both the options and restricted share units granted) for each of the top five named executive officers at our sample firms. The data on the options includes the number of options, their strike

price, maturity and time until they vest. We also gathered information on the total shareholdings of these executives. Because this data is only available electronically from 1997, we limit our analysis to the period from 1997 to 2006

Estimating the value for the cash components of compensation (i.e., salary, annual, other annual and bonus) is simple, but we require a model to determine the theoretical value for the equity-based compensation upon granting. For valuing the options, we start by using the standard Black-Scholes methodology under assumptions proposed by Hull and White (2002). For the inputs into our option valuation models we use data collected from DataStream. The risk-free rate is the yield on a composite index of government of Canada 5 to 10 year bonds. This rate captures the average maximum maturity for the executive stock options granted by our firms while also allowing the interest rate to account for the potential early exercise of these options. To measure volatility for the Black-Scholes model, we use the standard deviation of the weekly continuously compounded returns[9] calculated as $r_t = \ln(P_t/P_{t-1})$. To obtain the annualized standard deviation we multiply the standard deviation of the weekly returns by $\sqrt{52}$. If we assume the continuously compounded returns are independent and identically distributed, this is a reasonable estimate for the volatility. This would be the case if markets were efficient and stock prices followed a random walk.

The value for the executive stock options obtained using different valuation models (e.g., Black-Scholes or Hull-White) are what we refer to as the "theoretical", "potential" or "expected" current value – the value one would expect to get from exercising the options in the future. To get the actual value realized for their stock options, we gathered data from the filings made by insiders on the System for Electronic Disclosure by Insiders (SEDI) in Canada (www.sedi.ca). SEDI contains electronic listings for the disclosed transactions of all insiders at Canadian firms

[9] Though daily data may provide us with a better estimate of the realized volatility for a given firm and thus a better estimate of the future volatility, the daily data is complicated by weekends, holidays and potential day of the week effects. For example, we know that volatility is different over the 3 days from Friday to Monday than from Monday to Tuesday. Using weekly data avoids these complications.

from 2003 to present. In these listings we have the date on which the insiders exercised their options, the number of options exercised, the strike price of the options exercised and the stock price on the day of exercise. Using this information we can determine the realized value of the options by comparing the strike price for the options exercised to the current stock price. We can also estimate the potential or theoretical value by matching the exercised options with the executive's granted options to determine when the exercised options had been granted.

For the measures of corporate governance, we use information from the proxy circulars for each of our sample firms at the end of each fiscal year. From these proxy circulars we collect information on the characteristics of the members of its board of directors and other important features which have been found to influence how the firm is governed and executive compensation is determined in previous studies. Firm performance is measured using firm-level data on net income, total assets, and the market value of equity from Datastream.

4. Analysis:

Before starting our formal analysis, we look at some descriptive statistics for the components of the compensation for the top five executives at our sample firms over the period from 2000 to 2005. In Table 1a we characterize the compensation for the CEOs at our set of S&P/TSX60 firms. The average of the annual median CEO total compensation for our sample period was almost $2.6 million with a little over $900,000 coming from salary and the rest from bonus (about $900,000) and equity-based compensation such as options[10] (over $750,000). Expanding the definition of compensation to include income from dividends and other cash disbursements related to equity ownership over the year has only a limited impact since the average median dividend payment was only $43,000. Although dividends add, on average, barely 2% to the total compensation for our sample of executives, we find several examples

[10] The Hull-White model was used to estimate the theoretical value for the ESOs, because it allows for early exercise and early departure/forfeiture. In the model we used the risk-free rate and volatility on the day the options were granted.

where this rises to over 10%. Table 1b contains information on the compensation for the other named executive officers (NEOs). It is interesting to note that the overall level of compensation was less than half that for the CEOs – the NEOs had an average median total compensation of just over $1.1 million. For the non-CEO executives, the distribution of their compensation was also slightly different – they received about $465,000 in salary, $365,000 in bonus, and almost $290,000 in options. These values correspond to a distribution of income for CEOs (NEOs) of 35% (42%) salary, 35% (32%) bonus and 30% (25%) options and other equity-based compensation[11].

Despite the differences in the distribution of compensation across levels of executives, it is clear that contingent or performance-based compensation plays a very significant role in the total compensation for all of our senior executives. The relative importance of options has changed the most dramatically over time – for the CEO, options have ranged from a low of 16% to a high of 52% of their total compensation and the range is from 20% to 45% of total compensation for the other named executives. These numbers highlight many things. First they are consistent with the frequently held belief that there should be more pay-for-performance and thus more equity-based compensation for the CEO than the other NEOs. Second they illustrate the importance of correctly valuing options – changing the assumptions to increase or decrease the value of executive stock options can have a significant impact on the disclosed values for the total compensation of the senior executives. Further if executives value these options differently than our models, we may be significantly mis-stating their role in aligning shareholder and management interests.

4.1 Pay-for-Performance

As a first step, we perform a qualitative analysis of pay-for-performance by comparing the average compensation values for our executives in Figures 1a and 1b to the value of the

[11] These percentages are similar to those of executives in the U.S., except that U.S. executives receive relatively more compensation in the form of options (e.g., Murphy (1999)).

Canadian market index in Figure 2a. From 2000 to 2006 there is a clear correlation between the value of the Canadian stock market and the total annual compensation for the CEOs in our sample. Looking at the components of compensation, it appears that there is a contemporaneous correlation between compensation and stock market performance (i.e., there is a degree of pay-performance sensitivity) in the value of the salary and bonus to the equity market and for options or equity-based compensation there appears to be a relationship with a lag of one year to changes in the equity market. Overall, it therefore appears that aggregate CEO compensation packages at our sample firms are at least somewhat aligned with the concept of pay-for-performance. Extending our analysis to the other NEOs we do not find that the average compensation for these managers presents the same degree of pay-performance sensitivity. The NEOs receive relatively more compensation through a stable salary so their total compensation is less sensitive to performance as can be seen in Figure 1b.

Because our qualitative analysis suggests a potential relationship between executive compensation and performance, especially for the CEO, we formally investigate this relationship and correct for the potential influence of factors known to impact the level and type of compensation for executives. To accomplish this, we regress the compensation of our executives on different measures of performance and a set of control factors commonly found to influence executive compensation in past research. Specifically, we estimate the following model:

$$\ln(\text{Executive Compensation}_{i,j,t}) = \alpha + \beta_1 \text{control factors}_{i,t} + \beta_2 \text{firm performance}_{i,t} + \varepsilon_{i,t} \quad (1)$$

where we use the aggregate level of compensation as well as the level of each component of compensation at firm i, for each of the executives j in year t, controlling for industry, firm size, year and measures of corporate governance and examining the role of various measures of performance for firm i in year t. The model is estimated using a cross-sectional time series model with random effects to capture the possible relationships between the executives from the same firm over time. To measure firm performance we use some of the most commonly used measures. Specifically, we capture firm performance from a variety of different perspectives: the

accounting-based profitability of a firm using Return on Assets (ROA), the market-based return to shareholders using the Total Shareholder Return (TSR) and a market-based measure of the future growth prospects of a firm using both accounting and market-based measures: the Book-to-Market ratio (BM).

We start by formally investigating the relationship between executive compensation and firm performance for our CEOs in Table 2[12]. After controlling for factors found to influence compensation in other studies, we find mixed evidence of pay-for-performance at our sample firms[13]. Our hypothesis that there exists pay-for-performance in CEO compensation packages would lead us to expect a positive relationship between compensation and both the ROA and TSR but a negative relationship with BM. Looking at the total CEO compensation in Table 2a we find that the total compensation increases as the growth in ROA increases. For the level of ROA, however, we find a negative relationship with compensation. This implies that firms with increasing profitability over time compensate their executives more than those where the profitability is either stagnant or decreasing. Consequently, this suggests that it is the changes a CEO is making and not the stability of the level of profits that are rewarded by the market. This is consistent with the argument that CEOs simply maintaining (i.e., not growing) the business do not get as highly compensated.

An interesting concern that is raised by these results is that ROA can not increase forever. Consequently, we consider the potential asymmetry in the role of increasing and decreasing growth of profitability as well as positive and negative ROA by looking at firms in financial distress. When we control for firms in financial distress (i.e., firms with negative earnings), we

[12] Note: the results are only presented for the CEO, because the pay-performance relationships are all statistically insignificant for the NEOs as suggested by our qualitative analysis. It is, however, important to note that the decrease in the significance of the different relationships for the NEOs is consistent with the belief that their actions have a smaller impact on firm value and thus their compensation should be less linked to performance.

[13] Although the results are only presented for contemporaneous relationships, we also estimated models using lagged measures of firm performance in the past 1, 2 or 3 years. Since the results were most significant and most consistent using the contemporaneous measures, we focus our attention on these results.

find evidence of a relationship between compensation and the level of ROA but a decrease in significance with respect to the role of changes in ROA. For firm performance measured using the BM, we find compensation increases as firm performance increases (i.e., as the market is viewing the firm's growth opportunities more favorably) providing some evidence of pay-for-performance. We find an insignificant (though positive) relationship between TSR and compensation. These results highlight several potentially important issues with respect to the definition of "performance".

To more thoroughly investigate the source of the mixed evidence of pay for performance, we examine the pay-performance sensitivity individually for different components of compensation in Tables 2b to 2d. We start, in Table 2b, by considering the role of salary. Not surprisingly, we do not find any relationship between the level of an executive's salary and our measures of firm performance. The salary portion of compensation is a non-contingent source of compensation and, as such, is meant to provide the executives with a base level of compensation and thus it is not intended to be sensitive to firm performance.

When we move to the more performance-based types of compensation, we find interesting differences in their degree of pay-performance sensitivity. These components of compensation are designed to be contingent on the attainment of some form of performance goals. The first we consider is the bonus in Table 2c. The bonus is designed to reward the attainment of short-term goals. Though this is relatively discretionary and the goals can be both quantitative and qualitative, the bonus is explicitly designed to provide short-term incentives for performance (i.e., the targets are short-term performance goals). In Table 2c, we find very significant evidence of pay-for-performance. We find a positive relationship between ROA growth and levels and bonus compensation and a negative relationship between the Book-to-Market ratio and bonus compensation. Though not statistically significant, the relationship between TSR and bonus-based compensation is also positive. Consequently, we find evidence of pay-for-performance with the bonus paid to our CEOs.

Moving to the equity-based compensation where we expect to observe the strongest pay-performance relationship in Table 2d, we find only minimal pay-performance relationships. There is a strong relationship between the size of equity-based compensation and a decrease in the book-to-market ratio and increases in the share price or TSR. Since a large part of the value for our equity-based compensation is based on trends in equity prices, we need to be careful as at least part of the relationship may be endogenous. We will investigate this further in the next section.

Although not the focus of our analysis, the results in Table 2 confirm previous findings that our corporate governance variables do influence the level of compensation. Specifically, we find that cross-listing and having more independent directors is related to higher total executive compensation. Looking at the components of compensation, we find that the salary increases with more independent directors, the level of the equity-based compensation increases for both cross-listed firms and firms with more independent directors and there are no significant relationships between our corporate governance-related factors and the level of bonus paid to our CEOs. These findings suggest a significant role for corporate governance in the overall compensation determination process, but, interestingly, not with respect to the bonus where we find the strongest evidence of a pay-performance relationship.

To improve our understanding of the role of corporate governance-related factors and pay-for-performance, we also evaluate the impact on compensation of interactions between different factors and our performance measures. These interactions allow us to investigate how the pay performance sensitivity changes under different governance regimes in addition to the direct relationship between pay and performance and pay and governance found earlier. Since the results are similar for all of our measures of performance, we only present the results for the interactions between the Book-to-Market ratio and our corporate governance variables in Table

3[14]. For the total compensation we find a positive interaction between the book-to-market ratio and cross-listing indicating that cross-listed firms have a better pay-performance sensitivity. However, firms with directors on multiple boards have a lower level of pay-performance sensitivity. For salary, we find that only the number of experts on the board influences the pay-performance sensitivity – more experts leads to a higher degree of pay-performance sensitivity with respect to the level of the salary paid to the CEO. Looking at the level of the equity-based compensation, we find that the level of pay-performance sensitivity increases with cross-listing and having more experts on the board, but decreases with directors on multiple boards. Interestingly, we find no significant interactions for pay-performance sensitivity with respect to the level of the bonus. Consequently, we find evidence that the pay-performance sensitivity is also related to some basic measures of corporate governance.

Overall, we find a degree of pay-performance sensitivity in the compensation for the CEO but not for the remaining NEOs. The level of pay-performance sensitivity varies significantly across the components of compensation – there is some evidence of pay-for-performance in the bonus and LTIP, the components explicitly designed to compensate for performance. A key concern is the validity of these compensation values. Since the bonus is a cash-based compensation, we are confident in the strength of the pay-performance relationship between the bonus and our measures of performance. However, the relationship between option-based compensation and performance may be dependent on the option valuation method. This means that the currently weak relationship between the value for the equity-based compensation and performance may be dependent on how we are valuing these options. Although other studies have also documented that a significant portion of the pay-performance relationship is a result of options in the U.S., they have assumed that the value applied to the options was correct. Since

[14] The results from interactions with industry and year were statistically insignificant and thus are not presented.

this may not be the case and it may either strengthen or weaken our results, we investigate the robustness of our results to changes in the option valuation methodology in the next section.

4.2 Pay-for-Performance and the Valuation of Options

Because of the importance of equity-based compensation and the inconsistent nature of the pay-performance relationship between equity-based compensation and our different measures of performance, we investigate the valuation of options more carefully. Specifically, we re-examine our results using both the theoretical value for options (the value used in the preceding analysis) and the realized value (the value the executives actually obtained upon the exercising of the options). The media suggests that firms understate the value of executive stock options to decrease the value the firm must expense whereas executives and many academics suggest that the theoretical value may overstate the value of these options because they are valued using methodologies which do not account for the many restrictions on executive stock options (i.e., Black-Scholes model). To ensure that our results are robust to changes in the assumptions used to value the options at granting, we compare the theoretical and realized values for our options and our pay-performance results.

The first step is to determine whether there is a difference between the theoretical and realized values for options. We consider the realized value for all of the options received and exercised by the executives at our set of firms over the period from 1997 to 2007. The required information is available in electronic format from SEDI (System for Electronic Disclosure by Insiders at www.sedi.ca). The data includes the number of options granted, the date of granting, the strike price and the time to maturity as well as the date of exercising, the number of options exercised and the price at the time of exercising the options. We compare the realized value with the theoretical value that would have been applied to these options at the time of granting and therefore would have been disclosed as part of the executive's compensation in that year. To ensure the robustness of our results and the corresponding conclusions, we use a variety of

different option valuation models, including the most standard model which was used in the previous section, Hull and White (2004).

Using four of the most commonly used option pricing methodologies – a basic Black-Scholes model, an enhanced Black-Scholes model allowing for both early exercise and forfeiture and the corresponding binomial versions of these models, we find that the standard Black-Scholes methodology using the maximum maturity (i.e., not correcting for employee exit before maturity) provides, not surprisingly, the highest valuation over various maturities – see Figure 3. The Hull and White enhanced Black-Scholes methodology and the enhanced binomial model provide much lower (but similar) valuations. In the Appendix we discuss the impact on the theoretically-obtained valuation of options resulting from changing some of the other assumptions. Qualitatively, we can see some of these differences in Figure 4 on the estimated price for a standardized option[15]. For example, by using a 5 year maturity rather than a 10 year maturity to account for executives' early exercising of options, as firms have recently been doing, the theoretical value of the standard option we use for comparison purposes fell by over 20%.

Since the results in Figures 3 and 4 suggest that having firms use the standard Black-Scholes model with the full maturity for the options and using the volatility and interest rate as measured at the time the options were issued should provide an upper bound for the estimated value of our executive stock options[16], Figure 5a compares the corresponding maximum theoretical values for the executive options to the realized value on the day the executive exercised the options discounted to the day of granting[17]. The theoretical and discounted realized values appear to be normally distributed, but the realized values have a much higher average and

[15] The characteristics of the standardized option are described in the Appendix.

[16] In the Appendix we provide a more complete discussion of the issues involved in the valuation of options as well as an empirical examination of many of the key assumptions in estimating the value of employee stock options. We find that there are significant violations of the standard Black-Scholes assumptions for estimating the value of ESOs and the majority of these violations, over the period of our study, should have resulted in an over-valuation for ESOs.

[17] The realized values are discounted using the risk-free rate at the time the options were issued. One could argue for the use of higher risk-free rates to adequately compensate the executives for their time value of money, but the results remain qualitatively the same when we use this or a higher discount rate.

a much broader dispersion. The higher average for the realized values suggests that either executives are able to optimally time the exercising of their options (i.e., they exercise their options when the stock price is relatively high) or the Black-Scholes model under-estimates the true value of the options. The broader dispersion suggests that there is a large level of uncertainty in the actual value that executives receive.

Unlike the media where they focus on the value realized upon exercising the options, we compare theoretical values which could have been applied to the options upon granting with the discounted realized value. The discounting of the realized values ensures that we are comparing the values in constant dollar terms as the Black-Scholes value is the present value (i.e., the value on the day of granting) of the expected future value to be obtained upon exercising the option. The problems resulting from over-looking the discounting of the realized value can be seen in Figure 5b where both the dispersion of the realized returns and the mean value of the realized returns decrease following the discounting.

Table 5 presents summary statistics for the differences between the Black-Scholes calculated theoretical maximum values and the realized values. Although the mean realized gain of executives' exercised value for options over the Black-Scholes value is more than $7.75 per option (or a gain of slightly more than 20% of the strike price), the executives did not always realize a value greater than the Black-Scholes value – the minimum gain was -$47 per option (Note: the executive still obtained value from exercising the options as the stock price was greater than the strike price. It is simply that the executive was getting $47 less than had been predicted at the time of granting using the Black-Scholes model.). Because the average realized value from executives' exercising their options is larger than the value forecasted using the Black-Scholes methodology and the Black-Scholes model we use in this analysis provides the highest valuation of all versions of the model (significantly higher than the models currently used by most firms and used in the previous section), this suggests that the recently proposed modifications of the Black-Scholes model which decrease the estimated potential value for executive stock options do

not provide more realistic measures of the value of executive stock options and may further diminish our ability to find evidence of a pay-performance relationship for executives.

To evaluate the statistical significance of the difference between the realized gains and the theoretical value for our set of executives, we use a t-test. We can not, however, simply use the mean and standard deviation for the realized gains in Table 5, since the option grants were not all independent events. Many of the options being exercised are from the same firms, the same executives and some are even options from the same grants that were exercised at different times, so we need to correct the standard errors to perform the t-test. After correcting for multiple observations from the same firms and individuals, we obtain a t-statistic for the discounted realized gains of 8.1 for all of the exercised options. This indicates that executive stock options do provide the executives with significantly more value than predicted by our option valuation methodologies. Not surprisingly, we find that the significance of this difference changes over time. The majority of the large gains from option exercises occur later in the sample – the t-statistics are 3.02 for 2003, 5.83 for 2004, 6.61 for 2005 and 9.73 for 2006.

To examine the robustness of our findings for differences between the option valuations we consider several potential explanations for these results. We examine, for example, the impact on the differences between the realized values and the theoretical value when using i) the 10 year government bond rate rather than the 5 to 10 year standardized government bond, ii) deducting a 2% transaction cost from the realized value, and iii) assuming that for every two option exercises there was an option that expired worthless. Not surprisingly, these changes result in a decline in the statistical significance of the differences but not a disappearance in the statistical significance. Looking at the stock price at the time of exercise relative to the value before and after, it appears that executives are able to time the exercising of their options to profit in ways not captured by the models (similar to the findings in Carpenter and Remmers (2001)).

At a general level, one can see that the realized value will only equal the theoretical value if almost half of all of the options granted expired worthless either because the executive left

before the options vested, left while the options were out-of-the-money or retired while the options were out-of-the-money. Though we can not determine what happened in every case, we do find that our executives tended to exercise their options well before maturity and when the stock price was at a relative high point. Since share prices generally increase over any given 10 year period, it is unlikely that the majority of executives would have had to forfeit their options.

In our previous analysis of pay-for-performance, the value for options that we used was therefore smaller than the value actually realized by executives. Repeating the previous analysis using more accurately estimated (i.e., higher) values for the compensation associated with options, we do not, however, find an increase in the pay-performance sensitivity for executive compensation. Although the differences in option valuation methodologies have a significant impact on the disclosed value and its relationship to the true value realized by the executives, they do not appear to play a significant role in the pay-performance sensitivity of our analysis.

4.3 Role of Corporate Governance

Because the difference between the realized and theoretically estimated option values did not appear to influence the pay-performance sensitivity, we examine the relationship between this difference and measures of a firm's corporate governance structure. Our measures of corporate governance play a significant role in determining levels of executive compensation so they may also help explain this difference and the weak pay-performance sensitivities of either realized or theoretically estimated option values. Specifically, we investigate whether there is a role for corporate governance-related factors in the ability of executives to exercise their options at better prices and/or to receive their options at more advantageous prices – either of which could result in the apparent underpricing of executive stock options and a decrease in the estimated pay-performance sensitivity.

Our empirical tests employ a linear cross-sectional time series regression model relating our set of variables related to a firm's corporate governance system and its performance since the

granting of the options ($f_{i,t}$) to the difference between the theoretical and realized option values ($y_{i,t}$) for the executives of firm i at time t:

$$y_{i,t} = \alpha + \gamma f_{i,t} + \varepsilon_{i,t} \quad (2)$$

We estimate this as a mixed model containing both fixed and random effects. The residuals are modeled to account for heteroskedasticity and first-order serial correlation related to the persistent effects from using observations for the same firm and possibly even the employee over our sample. To control for the systematic variation for each firm that may not be captured by our explanatory factors, we model firm and employee specific differences as random effects. Modeling these as random effects is more appropriate than modeling them as fixed effects because our data is a sub-sample of all Canadian firms and our set of independent variables contain several measures which are relatively time invariant.

To investigate the role of various factors on the apparent mis-valuing of options, the results from the estimation of model (2) are presented in Table 6. We start by looking at a variety of performance measures which capture the changes in firm performance between the time of option granting and the time of exercise. All of the estimated coefficients have negative values and most are statistically different from zero in both the full model as well as a model containing only the performance based measures. If the difference between the realized and theoretical values was due to improved firm performance since the granting of the options, we should have seen a positive relationship – better performance is related to larger realized gains. This suggests that the greater realized value does not appear to be related to improved performance.

For the different measures of corporate governance, we find several interesting relationships. We do not find a significant industry effect. We do, however, find significant evidence that having more independent and expert directors decreases the amount by which the realized value exceeds the theoretical value applied to the options at granting. This is consistent with the idea that these directors are more careful about the timing and pricing of options at granting and these firms may be more transparent so the stock price is more a more accurate

representation of the true value. Firms on which there are directors sitting on multiple boards but especially firms that are cross-listed in the US are related to an increase in the difference between the realized and theoretical values. The standard argument for the evidence that the presence of directors on multiple boards is related to larger differences in the values of options is that these directors may not focus as much on the executive compensation contracts. However, in this case, it could be that directors on multiple boards are more likely to also sit on boards of either interlisted firms or U.S.-based firms and there is something about the use of options for interlisted firms which allows executives to benefit more from the exercising of executive stock options. Though beyond the scope of the current paper, it could be related to the increased compensation received by executives at interlisted Canada firms (e.g., Southam and Sapp (2009)).

5. Conclusions:

The previous analysis provides some evidence in support of pay for performance in executive compensation packages. Although we were expecting to find this relationship with respect to the equity-based compensation, we found the strongest relationship with the bonus. And these results were not dependent on the use of either accounting or market-based performance measures, though they were stronger for the accounting-based measures. Since bonuses are paid in cash, we were confident about the value applied to bonuses. We were, however, less comfortable with using just the theoretical value for options as significant evidence exists suggesting that these models may not correctly capture the true value of executive stock options to the executives.

In examining the differences between the theoretical value for executive stock options and the true value realized at the execution of these stock options, we find that the true value for executive stock options is significantly larger than one would have estimated using even the most generous assumptions with Black-Scholes model, contrary to the discussion of theoretical papers examining this issue. Although the arguments provided for under-valuation of ESOs using the

theoretical models were supported empirically, we found that these issues under-estimated the value of private information and the ability to exercise options at any time. Using methods to more accurately capture the true value to executives of the ESOs we investigate the sensitivity of our results to different assumptions for the values used in the option valuation models and do not find a significant improvement in the pay-performance sensitivity.

Our analysis provides evidence that there is a degree of pay-for-performance in our set of the largest Canadian firms. Since this is found to originate from the executive bonus and not equity-based compensation and bonuses form a larger percentage of Canadian versus U.S. compensation, it is not surprising that previous studies focusing on the U.S. have found only weak evidence of pay-for-performance. By examining the differences between the theoretical (i.e., disclosed) value for executive stock options and the actual (i.e., realized) values, we ensure that our weak evidence of pay-performance sensitivity from options is not due to problems wit th evaluation of options. Even though corporate governance considerations are generally not considered a direct aspect of the pay-performance debate it is worth noting that we find that the weak corporate governance structure is more likely to result in weaker pay-performance relationships.

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Appendix:

The valuation of executive stock options is complicated by the fact that the methods used to value standard stock options (e.g., the Black-Scholes model) are based on assumptions which are unlikely to hold for executive stock options. As pointed out by authors such as Rubinstein (1995), Hall and Murphy (2002) and Hull and White (2002 and 2004), employee stock options differ from standard options in several important dimensions. First, standard options are liquid and can be traded. This is important because it means investors can sell their options rather than being forced to exercise them. Selling the options allows the investor to get both the value they would have obtained from exercising the option as well as a value due to the remaining time to maturity. This is crucial for the dynamic hedging at the heart of the Black-Scholes model.

Related to the maturity of executive stock options is the fact that standard options valued by Black-Scholes have maturities up to, at most, one year. Because of these relatively short maturities, the values used as inputs into the Black-Scholes model can reasonably be assumed to be stable over the life of the option. It does, however, become problematic over the longer maturities of executive stock options – executive stock options generally have maturities of up to 10 years in length[18]. Although the existing theoretical and empirical evidence (e.g., Brooks, Chance and Cline (2007)) find that 92.3% of ESOs are exercised early (within an average of 5 years from granting), this is still significantly longer that the periods considered by the standard Black-Scholes methodology.

Going beyond the method of valuation, the illiquidity of executive stock options and their possible forfeiture if the executive leaves the firm either prior to the vesting of the options or when the options are out-of-the-money may induce employees to exercise their options early and give up the time premium. This is consistent with what we observe even though some argue that early exercise is irrational if the executive plans to remain with the firm. Using the full maturity

[18] The average time to execution in our sample, though considerably less than the maximum maturity, is still almost 5 years.

in valuing the options should result in our methodologies overstating the value of these options. Nevertheless, Huddart (1994) shows that early exercise is optimal for risk-averse investors who are willing to give up the extra time value for the certainty of receiving the value today. Lambert, Larcker and Verrecchia (1991) and Hemmer, Matsunaga and Shevlin (1994) show that restrictions on short selling and hedging their option positions can lead executives to exercise their options early so they can rediversify their portfolio. Brooks, Chance and Cline (2007) argue that private information may also motivate early exercise: managers often have information which allows them to determine the optimal time to exercise their options.

To evaluate the robustness of the different option valuation methodologies, we compare the theoretical values to the actual, realized values. To ensure that the differences are not the result of the assumptions used in our models, we evaluate the inputs into the option valuation models. We start with the maturity of options. Theoretically, executives should hold their options until maturity if they plan on remaining with the firm. For the more than 2,300 option grants for which we have both granting and exercise information (Note: we do not have information on the number of option grants which have been forfeited[19]), we find that the average maturity was 8.69 years, however, the average time until the options were exercised was only 4.75 years (see Table 4). This confirms that executives do exercise their options early even though, theoretically speaking, executives should not exercise their options before maturity. This suggests that the executives may be exercising their options to: 1) rediversify their portfolios, 2) obtain funds for some other purpose, 3) take advantage of the stock price being at a high point, or 4) liquidate their position as they are leaving the firm and need to either exercise their options or

[19] The stock prices of the firms we consider have experienced periods of both depreciation and, more frequently, appreciation over our sample period. Since the aggregate market value in Figure 2a shows more frequent appreciations, we assume that most parting executives would have been able to exercise their options before leaving thus forfeiture should only have a minor impact on our results. Nevertheless, we simulate the potential influence of forfeited options below.

forfeit their value (Note: these are some of the most frequently proposed reasons, though there are many other potential reasons as well[20]).

Consistent with this empirical finding, many of the proposed modifications to the Black-Scholes model include a correction for early exercise. Specifically, many of the current modifications replace the full maturity (e.g., 10 years) with a lower value such as 5 years (N.B. this is the average time at which executives appear to exercise their options). One of the modifications made in more complex models is to incorporate probabilities of departure and early exercise rather than to simply decrease the maturity. To understand the impact of these changes on the theoretical value applied to ESOs, we value a standard option (issued at-the-money with a strike price of $25, risk-free rate of 6%, annual dividend yield of 3%, annual stock price volatility of 25%, a pre-vesting employee exit rate of 3% per annum and a post-vesting exist rate of 5% per annum) using several different methodologies. The values were obtained using the calculation tool developed by Hull and White (2002) and are presented in Figure 3 for different maturities.

Another of the other key assumptions in our option valuation models is the stability of the inputs over time. Over periods of less than one year it is not unreasonable to assume that the risk-free interest rate and volatility are stable. In Figure 2a we see that the level of the interest rate and the volatility of the stock market have been decreasing over our sample period. This indicates that the share price volatility and the risk-free rate used in our models are not constant and this may create problems when one assumes they are constant in our valuation models. To evaluate the potential impact on the valuation of options, Figures 4a and 4b present the valuation for our standard option with different levels of the risk-free rate and volatility. In Figure 4a, we see that changes in the risk-free rate have only a minor impact on the value of the options – a decrease in the risk-free rate of 1% is related to a roughly 7% decrease in the value of the option. Since the risk-free rate declined by slightly over 1% over our entire sample period, the impact on the

[20] We have excluded the receiving of dividends as a motivation for early exercise since most proxy statements mentioned that the executives would receive a cumulative payment for the dividends missed between the granting and exercising of the options.

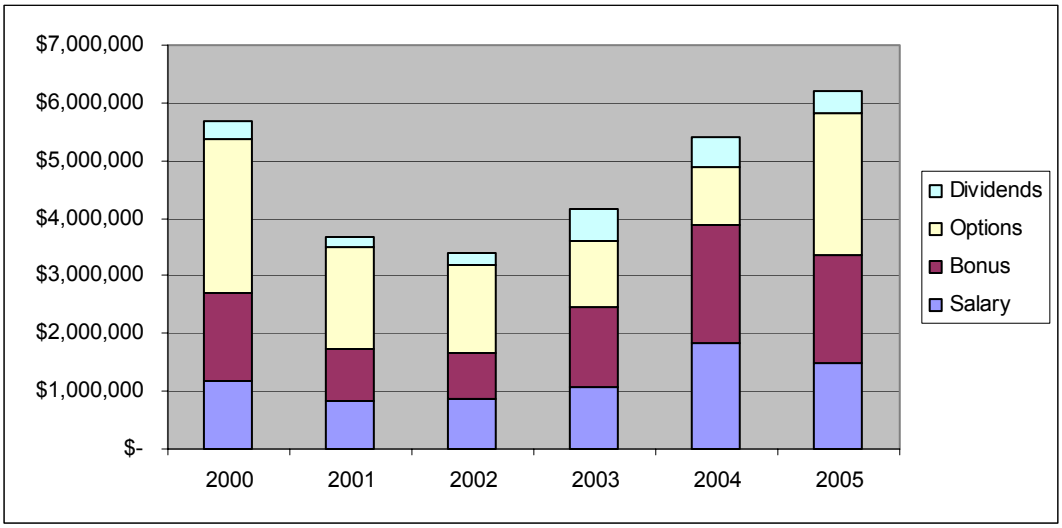
valuation of our executive stock options using a higher risk-free rate than was the case over the life of the option should be a slight over-valuation of the options (e.g., less than 7%). Figure 4b demonstrates that an increase in volatility of 5% leads to an increase in the estimated value of the option of roughly 15%. Over the period of our sample, the volatility for our sample firms has decreased by almost 15% suggesting that the potential value obtained using our option valuation models could have mis-estimated the true value of the options by up to 45%.

Overall, the early exercise of options should have resulted in the estimated value for the options *over-stating* the value received by the executives. The decreasing volatility of stock prices and interest rates over our sample period should have also resulted in the theoretical values at the grant date *over-stating* the options actual value. Consequently, we should find, ex post, that our theoretical values over-estimated the fair value of the options.

Figure 1: Average Executive Compensation 2000-2005

Compensation for the CEO and the other top 5 executives (NEOs) at 60 of the largest publicly listed Canadian companies over the period from 2000 to 2005. The compensation values are obtained from proxy statements obtained from SEDAR.

a: Mean CEO Compensation



b: Mean NEO Compensation

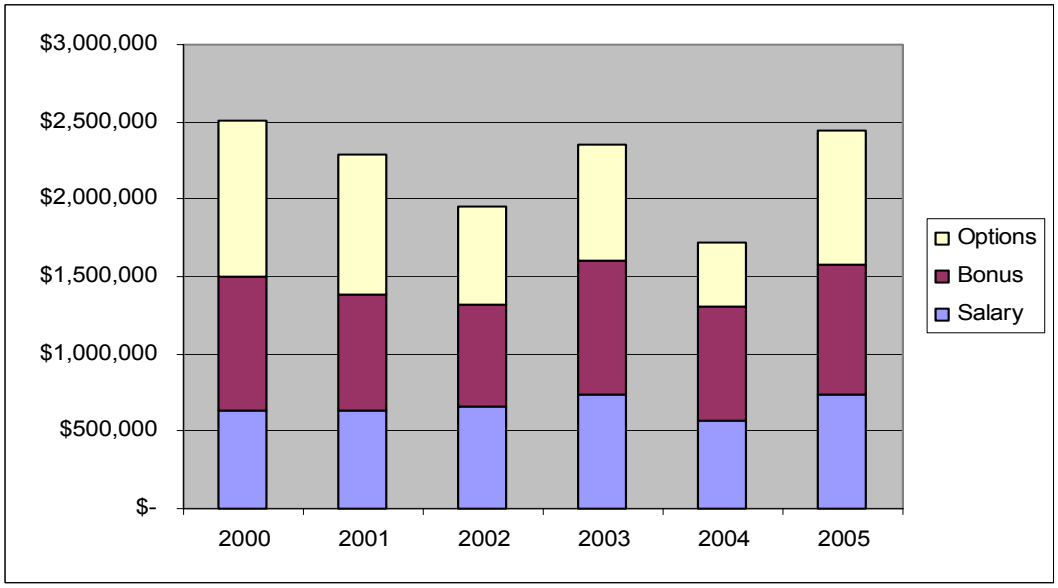
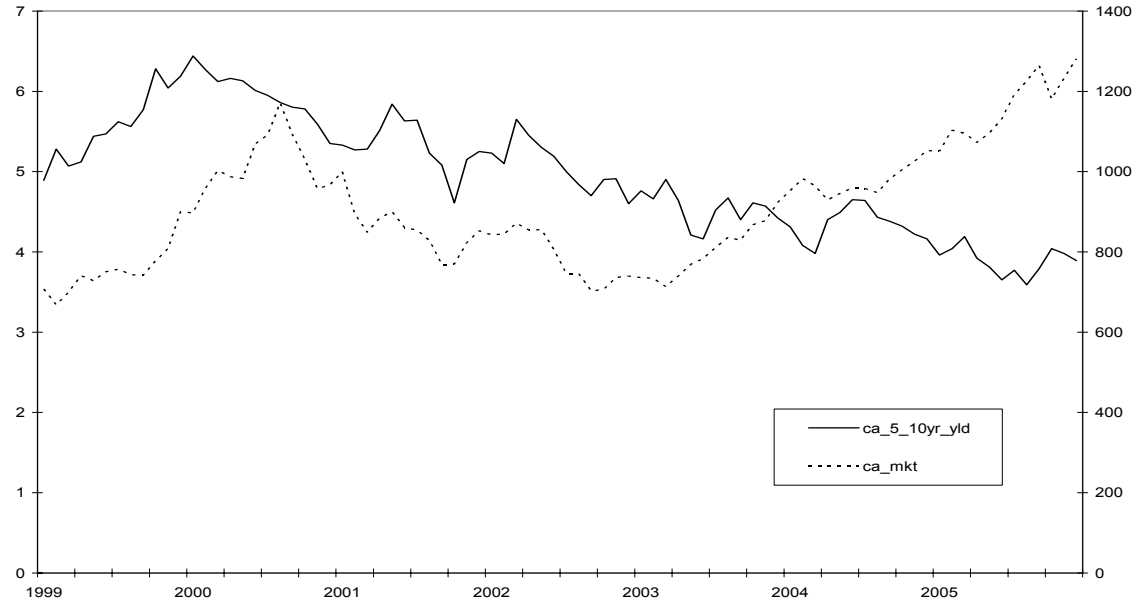


Figure 2: Canadian Financial Market Data

Information on Canadian financial markets over the period from 1990 to 2006. The data was obtained from Datastream for the Canadian equity markets (TSX Composite Index), a constant maturity 5 to 10 year Canadian government bond and the annualized volatility for the Canadian equity markets using monthly data.

a: Government Bond Yields and Equity Market Index



b: Annualized 12-month and 36-month Canadian Equity Market Volatility

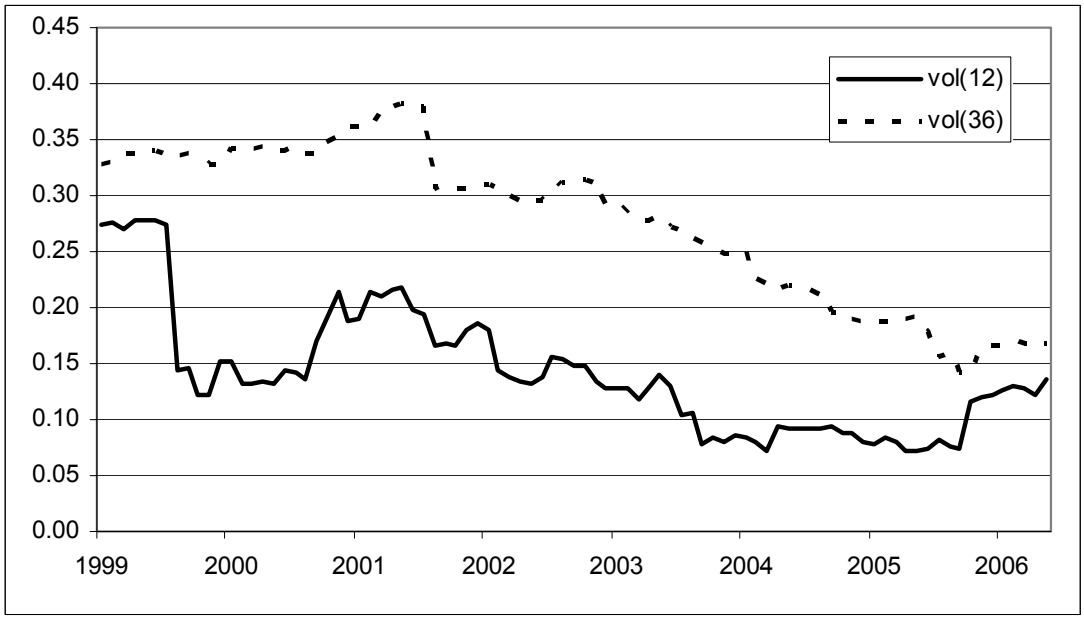


Figure 3: Comparison of Option Valuation Methodologies

Using standard scenarios with different maximum times to maturity (3, 5, 7 and 10 years), we calculate the value for the options one would have obtained using the standard Black-Scholes and binomial methodologies allowing for employees leaving the firm, an enhanced Black-Scholes valuation and a Black-Scholes valuation in which there is no accounting for the exit of employees.

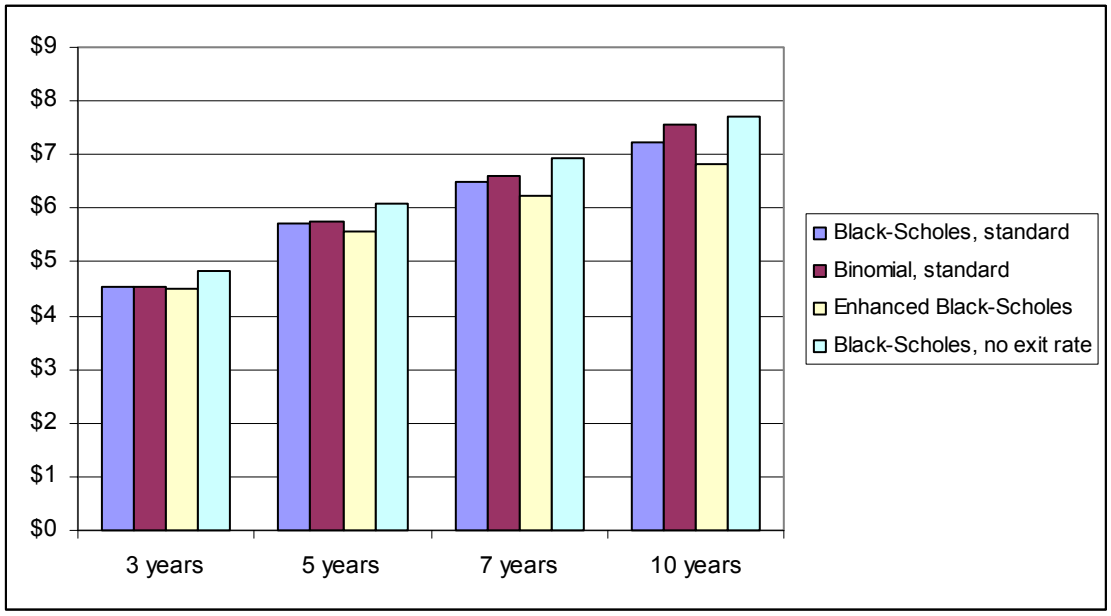
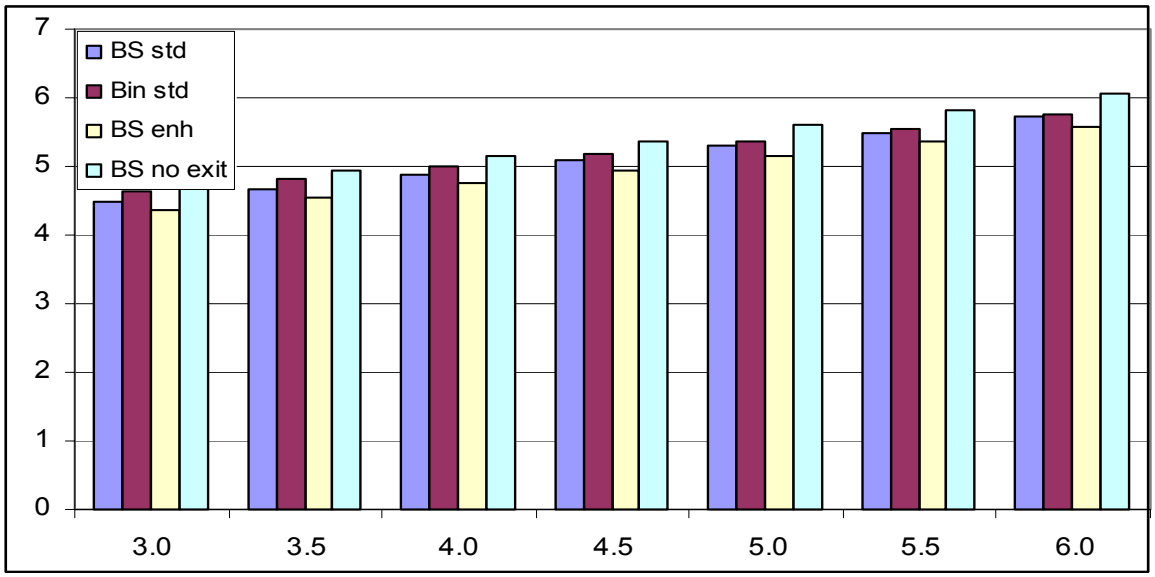


Figure 4
Using standard scenarios with different interest rates (a) and different volatilities (b), we calculate the value for the options one would have obtained using the standard Black-Scholes and binomial methodologies allowing for employees leaving the firm, an enhanced Black-Scholes valuation and a Black-Scholes valuation in which there is no accounting for the exit of employees.

a: Changing risk-free rates



b: Changing volatilities

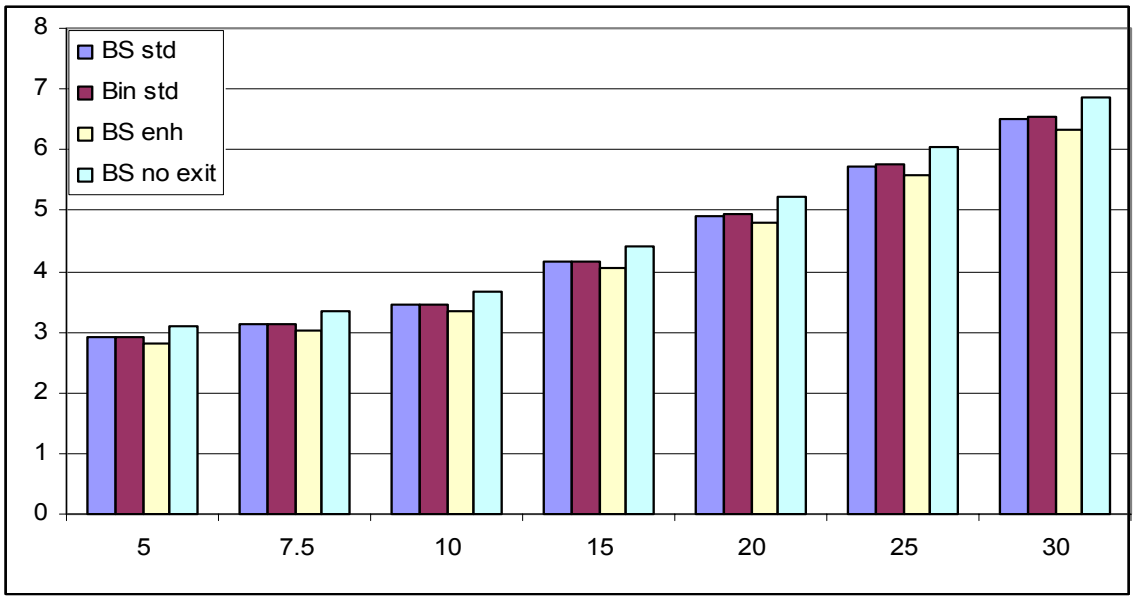


Figure 5a: Theoretical and Discounted Realized Option Values
The percentage gains from the exercising of executive stock options – the realized value relative to the Black-Scholes value at the granting of the executive stock options.

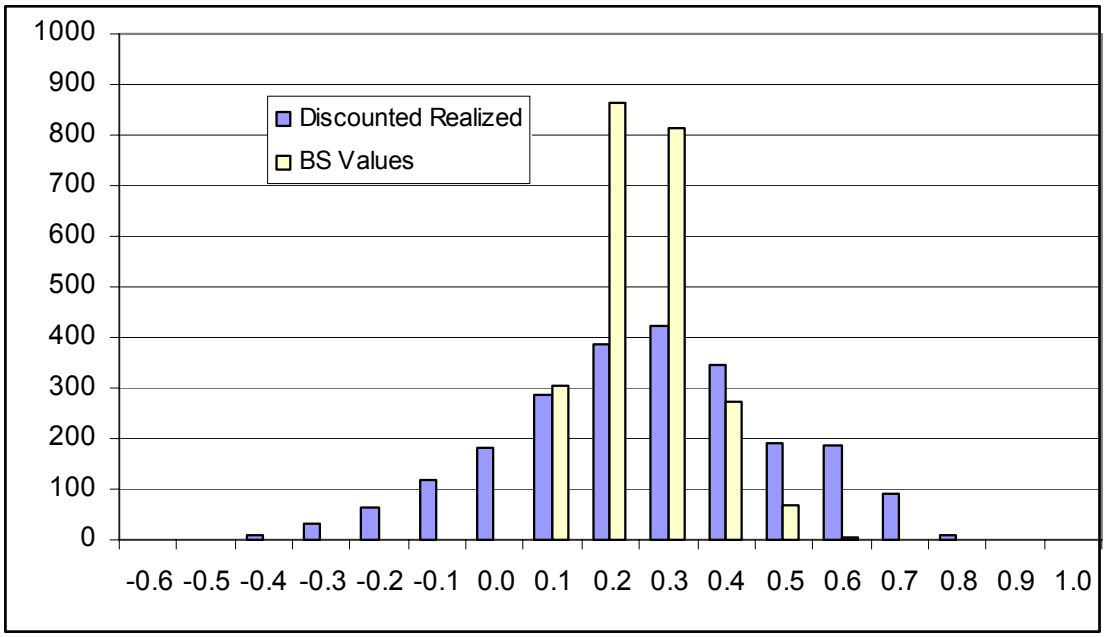


Figure 5b: Realized and Discounted Realized Option Values
The percentage gains from the exercising of executive stock options – the realized value relative to the Black-Scholes value at the granting of the executive stock options.

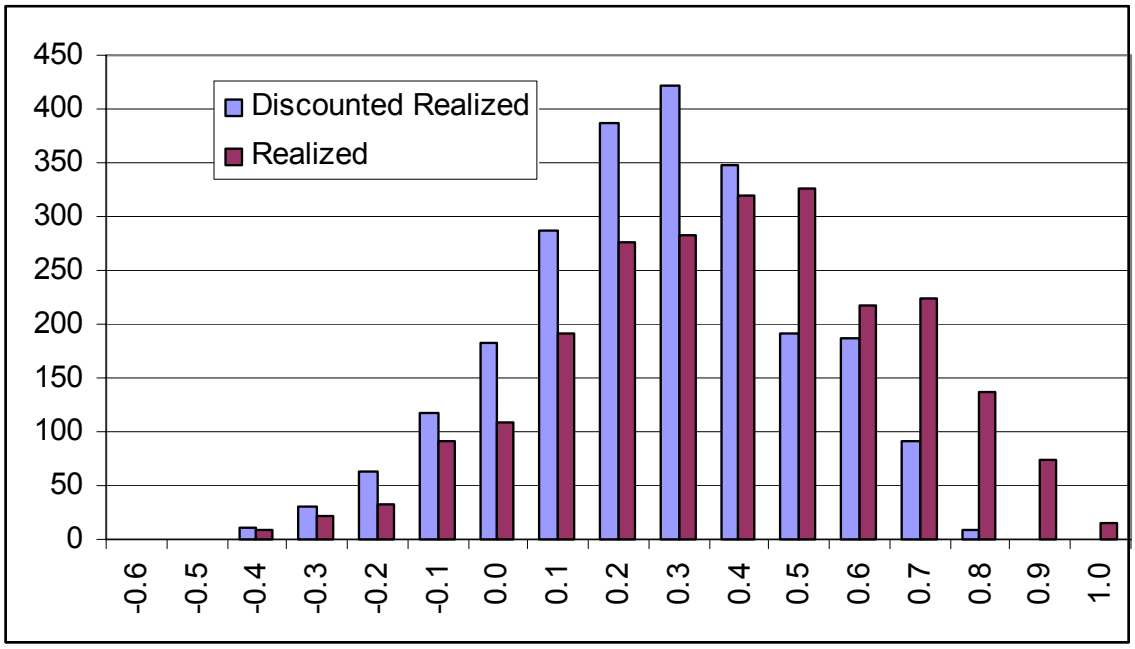


Table 1: Composition of Executive Compensation 2000 to 2005

Median compensation for the CEO and remaining top 5 executives at our set of the largest 60 Canadian publicly listed firms over the period from 2000 to 2005. The data was taken from the proxy circulars for these firms found on SEDAR.

a) CEO

	2000	2001	2002	2003	2004	2005	average
Salary	$ 761,112	$ 837,500	$ 882,144	$ 923,496	$ 995,262	$ 1,076,324	$ 912,640
Bonus	$ 722,492	$ 720,131	$ 607,400	$ 988,893	$ 1,138,923	$ 1,311,224	$ 914,844
Options	$ 781,927	$ 770,167	$ 842,910	$ 652,771	$ 452,117	$ 1,103,928	$ 767,303
Dividends	$ 35,081	$ 29,445	$ 30,928	$ 38,004	$ 52,218	$ 72,915	$ 43,099
Total	$ 2,265,531	$ 2,327,798	$ 2,332,454	$ 2,565,160	$ 2,586,302	$ 3,491,476	$ 2,594,787

b) non-CEO

	2000	2001	2002	2003	2004	2005	average
Salary	$ 421,786	$ 434,668	$ 472,838	$ 463,155	$ 502,835	$ 516,351	$ 468,606
Bonus	$ 332,464	$ 295,989	$ 254,353	$ 406,359	$ 450,825	$ 445,513	$ 364,251
Options	$ 305,086	$ 354,634	$ 203,736	$ 227,350	$ 161,914	$ 487,438	$ 287,014
Total	$ 1,059,336	$ 1,085,291	$ 930,927	$1,096,864	$1,115,574	$1,449,302	$ 1,122,882

Table 2: Pay-for-Performance

The results from running ordinary least squares regressins using the model $\ln(\text{Executive Compensation}_{j,i,t}) = \alpha + \beta_1 \text{control factors}_{i,t} + \beta_2 \text{firm performance}_{i,t} + \varepsilon_{i,t}$ to evaluate the evidence of a relationship between different components of executive compensation and a set of control factors and measures of firm performance. The compensation is based on the salary, annual, other annual, bonus and LTIP for CEOs at the firms making up the S&P/TSX 60 as of May 2007. The data is from 2000 to 2006.

a) Total CEO Compensation

	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Intercept	11.42	19.63	11.40	20.51	11.79	21.08	11.27	19.86	11.33	13.99
d_resource	-0.02	-0.14	-0.03	-0.21	-0.02	-0.12	-0.10	-0.66	-0.02	-0.15
d_util	-0.34	-0.74	-0.38	-0.89	-0.32	-0.69	-0.38	-0.87	-0.50	-1.23
d_fin	0.27	1.36	0.20	1.08	0.31	1.60	0.18	1.00	0.03	0.13
ln_sales	0.35	6.40	0.37	7.27	0.33	6.25	0.38	7.27	0.39	6.85
d_2001	-0.17	-1.41	-0.25	-2.06	-0.10	-0.88	-0.25	-2.01	-0.67	-1.66
d_2002	-0.28	-2.41	-0.32	-2.65	-0.18	-1.71	-0.25	-2.02	-0.61	-1.51
d_2003	-0.22	-1.61	-0.22	-1.58	-0.04	-0.30	-0.18	-1.29	-0.75	-1.83
d_2004	-0.37	-2.78	-0.35	-2.51	-0.08	-0.62	-0.30	-2.13	-0.67	-1.63
d_2005	0.03	0.21	0.08	0.55	0.18	1.47	0.05	0.35	-0.40	-0.98
TSX_Multi	-0.05	-0.27	-0.05	-0.30	-0.08	-0.39	0.10	0.59	-0.07	-0.39
interlist	0.37	2.90	0.37	3.08	0.32	2.60	0.40	3.34	0.27	2.31
Percent_Ind_Director	0.80	1.86	0.77	1.86	0.38	0.90	0.86	2.08	1.17	2.04
Percent_Mult_Director	-0.13	-1.01	-0.16	-1.20	-0.09	-0.73	-0.20	-1.51	-0.25	-1.80
Percent_Experts	0.02	0.10	0.06	0.29	-0.08	-0.45	0.08	0.39	-0.05	-0.23
D_CEO_Chairman_of_Board	-0.15	-1.13	-0.13	-0.99	-0.12	-1.00	0.00	0.02	0.06	0.49
Vol_Wkly_Ann	-0.24	-0.70	-0.25	-0.75	-0.26	-0.61	-0.13	-0.38	0.14	0.36
ROA_Growth	0.01	4.20								
ROA_Level			-1.71	-2.87	-0.89	-1.47				
D_Negative_ROA					-0.32	-1.49				
Book-to-Market Ratio							-0.40	-2.41		
Total Shareholder Return									0.05	1.22

b) CEO salary

	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Intercept	11.55	27.72	11.50	28.19	11.60	28.00	11.32	23.55	11.75	15.85
d_resource	-0.11	-0.85	-0.10	-0.80	-0.09	-0.76	-0.09	-0.62	0.05	0.28
d_util	-0.17	-0.47	-0.18	-0.51	-0.18	-0.53	-0.07	-0.17	-0.14	-0.30
d_fin	0.15	1.00	0.13	0.90	0.13	0.86	0.27	1.72	0.40	1.84
d_subset_fin_srvcs	-0.30	-1.59	-0.33	-1.78	-0.33	-1.77	-0.44	-2.13	-0.37	-1.33
ln_sales	0.20	5.01	0.21	5.39	0.20	5.12	0.20	4.42	0.17	2.99
d_2001	-0.04	-0.57	-0.06	-0.73	-0.05	-0.60	-0.03	-0.32	-0.18	-0.61
d_2002	-0.03	-0.33	-0.04	-0.48	-0.03	-0.36	0.00	0.01	-0.15	-0.49
d_2003	0.09	1.03	0.09	1.04	0.10	1.18	0.14	1.29	-0.11	-0.37
d_2004	0.07	0.74	0.07	0.81	0.08	0.92	0.22	2.04	-0.05	-0.17
d_2005	0.19	2.08	0.20	2.22	0.21	2.34	0.28	2.42	0.01	0.02
TSX_Multi	0.11	0.77	0.11	0.77	0.10	0.66	-0.10	-0.66	-0.48	-2.42
interlist	0.00	0.05	0.01	0.09	0.01	0.13	-0.09	-0.88	0.03	0.30
Percent_Ind_Director	0.65	2.09	0.64	2.09	0.60	1.97	0.82	2.35	0.81	1.55
Percent_Mult_Director	0.10	1.11	0.09	1.00	0.09	1.06	0.12	1.12	-0.06	-0.54
Percent_Experts	-0.05	-0.41	-0.04	-0.32	-0.05	-0.36	-0.16	-1.00	-0.11	-0.57
D_CEO_Chairman_of_Board	0.11	1.19	0.11	1.25	0.11	1.27	0.33	3.12	0.06	0.56
Vol_Wkly_Ann	-0.64	-2.80	-0.63	-2.82	-0.77	-2.53	-0.41	-1.51	-0.60	-1.80
ROA_Growth	0.00	0.37								
ROA_Level			-0.45	-1.15	-0.69	-1.64				
D_Negative_ROA					-0.23	-1.66				
Book-to-Market Ratio							-0.04	-0.32		
Total Shareholder Return									-0.02	-0.52

c) CEO bonus

	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Intercept	11.68	11.88	11.30	11.08	11.47	11.08	11.10	10.37	12.11	5.92
d_resource	0.04	0.16	-0.04	-0.14	-0.01	-0.04	0.04	0.12	0.44	1.08
d_util	-0.03	-0.04	0.11	0.14	0.09	0.11	-0.07	-0.09	-0.14	-0.15
d_fin	0.05	0.15	0.17	0.50	0.13	0.37	0.09	0.26	-0.33	-0.66
ln_sales	0.33	3.78	0.34	3.64	0.33	3.47	0.34	3.49	0.34	2.43
d_2001	-0.38	-1.68	-0.36	-1.62	-0.32	-1.51	-0.48	-2.17	-3.07	-3.04
d_2002	-0.55	-2.43	-0.49	-2.23	-0.46	-2.12	-0.62	-2.77	-3.41	-3.34
d_2003	-0.29	-1.17	-0.20	-0.82	-0.12	-0.50	-0.45	-1.80	-3.46	-3.36
d_2004	-0.15	-0.59	-0.10	-0.42	-0.05	-0.19	-0.27	-1.06	-3.15	-3.05
d_2005	-0.01	-0.04	-0.02	-0.10	0.03	0.12	-0.22	-0.84	-3.09	-3.01
TSX_Multi	0.40	1.28	0.42	1.24	0.34	0.99	0.23	0.73	0.02	0.04
interlist	-0.06	-0.28	-0.05	-0.24	-0.03	-0.14	-0.18	-0.81	-0.40	-1.37
Percent_Ind_Director	0.07	0.10	-0.09	-0.12	-0.29	-0.37	1.18	1.51	3.39	2.28
Percent_Mult_Director	-0.14	-0.59	-0.15	-0.62	-0.12	-0.53	-0.01	-0.04	0.10	0.30
Percent_Experts	-0.24	-0.67	-0.20	-0.55	-0.17	-0.48	-0.19	-0.53	-0.34	-0.61
D_CEO_Chairman_of_Board	-0.06	-0.27	-0.08	-0.36	-0.06	-0.26	0.16	0.67	0.41	1.29
Vol_Wkly_Ann	-2.70	-4.49	-2.28	-3.72	-2.40	-2.87	-2.59	-4.16	-4.02	-4.30
ROA_Growth	0.01	1.81								
ROA_Level			3.38	3.11	2.33	2.03				
D_Negative_ROA					-1.26	-3.18				
Book-to-Market Ratio							-0.84	-2.75		
Total Shareholder Return									0.16	1.37

d) CEO Options

	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Intercept	8.93	9.25	8.97	9.34	8.61	9.01	9.69	10.05	9.92	8.31
d_resource	-0.05	-0.23	-0.04	-0.19	-0.14	-0.64	-0.11	-0.45	-0.15	-0.62
d_util	-0.70	-1.14	-0.70	-1.16	-0.82	-1.50	-0.85	-1.31	-0.74	-1.35
d_fin	0.53	1.90	0.51	1.83	0.43	1.61	0.52	1.86	-0.06	-0.23
ln_sales	0.49	6.41	0.49	6.52	0.49	6.92	0.46	6.00	0.47	5.85
d_2001	-0.13	-0.82	-0.14	-0.92	-0.12	-0.72	-0.04	-0.28	-0.54	-0.84
d_2002	0.01	0.04	-0.01	-0.04	0.06	0.36	0.14	0.92	-0.38	-0.58
d_2003	-0.35	-1.97	-0.35	-2.00	-0.24	-1.30	-0.30	-1.67	-0.68	-1.04
d_2004	-0.31	-1.66	-0.31	-1.66	-0.16	-0.83	-0.28	-1.48	-0.58	-0.88
d_2005	0.02	0.09	0.02	0.09	0.22	1.16	0.00	0.00	-0.17	-0.26
TSX_Multi	-0.18	-0.60	-0.18	-0.60	-0.21	-0.78	-0.12	-0.45	-0.07	-0.27
interlist	0.39	2.27	0.40	2.33	0.47	2.81	0.32	1.86	0.46	2.68
Percent_Ind_Director	1.30	1.67	1.25	1.62	0.96	1.24	1.33	1.73	0.45	0.55
Percent_Mult_Director	-0.30	-1.58	-0.30	-1.61	-0.27	-1.40	-0.38	-1.97	-0.06	-0.28
Percent_Experts	-0.21	-0.73	-0.18	-0.61	-0.21	-0.71	-0.47	-1.64	-0.14	-0.41
D_CEO_Chairman_of_Board	-0.26	-1.50	-0.27	-1.53	-0.25	-1.44	-0.10	-0.54	0.09	0.48
Vol_Wkly_Ann	1.22	2.65	1.18	2.51	1.91	2.93	1.25	2.71	1.14	2.04
ROA_Growth	-0.02	-0.55								
ROA_Level			-0.56	-0.62	-0.94	-0.90				
D_Negative_ROA					-0.26	-0.84				
Book-to-Market Ratio							-1.08	-4.76		
Total Shareholder Return									0.13	1.73

Table 3: Pay-for-Performance with Interactions

The results from running ordinary least squares regressions using the model $\ln(\text{Executive Compensation}_{j,i,t}) = \alpha + \beta_1 \text{control factors}_{i,t} + \beta_2 \text{firm performance}_{i,t} + \varepsilon_{i,t}$ to evaluate the evidence of a relationship between different components of executive compensation and a set of control factors and measures of firm performance. The compensation is based on the salary, annual, other annual, bonus and LTIP for the top 5 executives at the firms making up the S&P/TSX 60 as of May 2007. The data is from 2000 to 2006.

	Total Comp		Salary		Bonus		Options	
Intercept	11.46	13.96	10.32	14.33	11.22	6.69	7.77	6.01
d_resource	-0.15	-1.06	-0.03	-0.19	-0.05	-0.17	-0.24	-1.08
d_util	-0.42	-1.04	-0.08	-0.22	-0.14	-0.18	-1.05	-1.84
d_fin	0.10	0.63	0.19	1.26	0.10	0.29	0.27	1.05
d_subset_fin_srvcs	0.05	0.25	-0.41	-2.09	-0.13	-0.30	0.17	0.51
ln_sales	0.36	7.49	0.23	5.27	0.33	3.29	0.50	6.87
d_2001	-0.22	-1.97	-0.05	-0.51	-0.48	-2.16	-0.04	-0.28
d_2002	-0.21	-1.87	-0.03	-0.31	-0.61	-2.71	0.17	1.02
d_2003	-0.11	-0.90	0.11	1.00	-0.43	-1.71	-0.22	-1.18
d_2004	-0.18	-1.44	0.18	1.69	-0.24	-0.94	-0.16	-0.82
d_2005	0.14	1.07	0.25	2.24	-0.19	-0.72	0.19	0.96
TSX_Multi	0.15	1.00	-0.03	-0.20	0.20	0.66	-0.01	-0.05
interlist	0.67	3.26	0.09	0.50	0.21	0.50	1.33	4.24
Percent_Ind_Director	0.48	0.62	1.57	2.32	1.24	0.78	2.05	1.70
Percent_Mult_Director	-0.59	-2.24	-0.21	-0.92	-0.45	-0.85	-1.42	-3.36
Percent_Experts	0.23	0.65	0.70	2.26	-0.96	-1.34	0.63	1.09
D_CEO_Chairman_of_Bo	0.01	0.10	0.36	3.40	0.11	0.43	-0.18	-0.95
Vol_Wkly_Ann	-0.40	-0.97	-0.67	-1.89	-3.25	-3.85	1.63	2.61
Book-to-Market	-0.72	-0.64	1.70	1.76	-1.40	-0.60	2.19	1.15
BM_interlisted	-0.72	-1.93	-0.39	-1.22	-0.87	-1.15	-1.97	-3.52
BM_independent	0.65	0.50	-1.68	-1.48	0.51	0.18	-2.78	-1.25
BM_multiDirectorship	0.99	1.81	0.73	1.54	1.10	1.00	2.53	2.85
BM_experts	-0.43	-0.59	-1.98	-3.18	1.88	1.30	-2.25	-2.03

Table 4: Descriptive Statistics of Option Maturity and Exercise Dates

The stated maturity for the options was taken from the proxy circulars found on SEDAR and the time to exercise was based on the date of exercise from SEDI.

	Stated Maturity (years)	Time to Exercise (years)
Average	8.69	4.75
Std Dev	2.07	2.10
Min	2	0.20
Max	11	10.64

Table 5: Theoretical and Realized Option Values

The values for the options (theoretical values obtained using Black-Scholes), the realized values are based on the realized values obtained using the data from SEDI, and the gains are relative to the B-S value at granting and they are discounted using the risk-free rate at the time the options were granted.

	Black-Scholes	Realized Value	Realized Gain versus B-S	Discounted Realized Gain	Percentage Discounted Gain
Average	$10.25	$28.28	$18.03	$ 18.35	21.2%
Std Dev	$ 6.89	$17.06	$ 18.00	$14.49	23.2%
Min	$ 0.37	$0.10	-$48.82	-$47.55	-64.9%
Max	$ 71.09	$143.50	$141.04	$102.15	77.9%

Table 6:

Estimates from the regression of a mixed model on the differences between the theoretical values for the options (obtained using Black-Scholes) and the realized values based on data from SEDI and firm-level measures of corporate governance and firm performance.

	Estimate	t-value	Estimate	t-value	Estimate	t-value
Intercept	0.462	2.97	5.385	2.18	0.207	4.89
D_resource	0.050	0.67	-0.995	-0.61	0.025	0.42
D_utility	-0.121	-0.63	-2.814	-0.63	-0.182	-1.13
D_financial services	-0.132	-1.30	-3.460	-1.62	-0.095	-1.22
TSX_Multiclass shares	0.104	1.01	1.741	0.84		
Interlisted on US and Canada	0.195	7.15	2.888	8.68		
Percent_Ind_Director	-0.604	-3.74	-6.000	-2.48		
Percent_Mult_Director	0.168	1.54	2.386	1.21		
Percent_Experts	-0.103	-1.70	-2.018	-2.48		
D_CEO_Chairman_of_Board	-0.010	-0.20	0.326	0.59		
ROS_growth	-0.162	-5.37			-0.187	-7.02
ROA_growth	-0.002	-4.36			-0.002	-3.84
Profit_margin	-0.327	-1.98			-0.475	-3.73