CANADIAN FINANCIAL RESTATEMENTS AND EXECUTIVE COMPENSATION

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ABSTRACT

The link between Canadian financial restatements and executive compensation is examined in this paper. We find no evidence that the sensitivity of total, vested and unvested option values, in-the-money-stock options, equity, restricted stocks and long-term incentive payouts are associated with the incidence of restatements for top executives, CEOs and CFOs. The total, vested and unvested option sensitivities are not related to the incidence of restatements due to accounting malfeasance. Except for the equity holdings of CEOs, restricted stock, equity holdings and long-term incentive payouts are not associated with the likelihood of restatements due to accounting malfeasance for top executives, CEOs and CFOs. The option sensitivities for top executives, CEOs and CFOs have no effect on the size of the restatements. The incentives from restricted stock are related to the size of restatements for top executives, CEOs and CFOs, and higher CFO equity holdings are related to larger restatements. Restating firms do not raise more long-term debt and equity capital in order to reduce the cost of external financing. Top executives and CEOs exercise more options during the first year restated when the magnitudes of the restatements are larger.

Keywords: Financial restatements; executive compensation; stock options.

JEL Classification: G30, G34, M52

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1 INTRODUCTION

Much of the prior literature, starting with Jensen and Meckling (1976), finds that executive compensation using stock options aligns the incentives of managers with those of shareholders. This literature finds that the asymmetric payoffs from stock options reduces agency costs for firms with high growth opportunities by encouraging them to take risk (Smith and Watts, 1992; Baber *et al*., 1996), option granting maximizes firm value (Core and Guay, 1999; Rajgopla and Shevlin, 2002), positive stock returns are associated with announcements of long-term managerial compensation plans (Brickley *et al*., 1985), and positive future payoffs are associated with stock options (Hanlon *et al*., 2003).

On the other hand, several studies challenge the use of stock options. Bebchuk *et al*. (2002) argue that executives have considerable power to influence their own pay and they use that power to extract rents. In addition, the desire to camouflage rent extraction might lead to the use of inefficient pay arrangements that provide suboptimal incentives and therefore reduce shareholder value. Bar-Gill and Bebchuk (2003) and Goldman and Slezak (2006) show that stock-based compensation provides incentives for managers to manipulate information in order to increase the value of a firm's stock.

Prior studies that examine the link between stock-based compensation and accounting fraud or financial restatements have primarily focused on CEOs and top executives (Erickson *et al*., 2006; Burns and Kedia, 2006; Efendi *et al*., 2006; Johnson *et al*., 2009). In contrast, Baranowski (2010) studies the relation between restatements and certain risk factors; namely, the value (not sensitivity) of backdated CFO stock options and material internal control weakness. Feng *et al*. (2011) examine the reasons why CFOs are involved in material accounting manipulations using data from Accounting and Auditing Enforcement Releases (AAERs) issued by the SEC, and not financial restatements.

Canada provides an ideal alternative laboratory for examining the impact of corporate restatements on executive compensation given its similarities and differences with the U.S. Both countries share similar legal, institutional and regulatory environments, including corporate governance mechanisms and

minority shareholder protections but not regulatory enforcement. However, Canadian public companies differ from their U.S. counterparts in that the percentages of Canadian public firms with controlling shareholders (concentrated ownership), families as the ultimate controlling shareholders, and issued restricted or subordinated voting shares and pyramidal structures are higher (e.g., Gadhoum *et al.*, 2005; Gadhoum, 2006; King and Santor, 2008). Since family-controlled firms, for example, are more likely to use dual-class shares as a means to separate ownership from control, this separation of ownership from control can create additional agency costs (Bebchuk *et al.*, 1999).

Thus, we extend the previous (primarily U.S.) studies by examining whether the incentives from stock options, restricted stocks, equity holdings and the long-term incentive payouts for top executives (including CEOs and CFOs) are associated with a higher likelihood of restatement for firms listed on the Toronto Stock Exchange (TSX). To the best of our knowledge, we are the first to examine the relation between financial restatements and equity-based compensation incentives from a Canadian perspective to further test the robustness of inferences drawn primarily for U.S. restatement announcements.

We investigate a sample of 146 Canadian firms who announced restatements over the period of 1997-2006 and 146 matched control firms using a novel, hand-collected dataset of executive compensation. We measure option sensitivity as the change in the value of stock options from a 1% change in stock price. Consistent with Erickson *et al*. (2006), we do not find that firms are more likely to restate their financial statements when the sensitivity of total, vested and unvested option values are higher for top executives, CEOs and CFOs. Incentives from equity, restricted stocks and long-term incentive payouts are not associated with the incidence of restatements for top executives, CEOs and CFOs, which is consistent with Burns and Kedia (2006). In contrast to Efendi *et al*. (2007), we do not find that restatements are more likely for firms that have higher in-the-money stock options.

Using an ordinal logistic regression to control for different prompters of restatements,[1] we find that total, vested and unvested option sensitivities are not related to the incidence of restatements due to accounting malfeasance. Except for the equity holdings of CEOs, restricted stock, equity holdings and long-term incentive payouts are not associated with the likelihood of restatements due to accounting malfeasance for top executives, CEOs and CFOs.

We examine whether option sensitivity is related to the size of the restatements measured as the cumulative impact of restatements on net income. The results indicate that option sensitivities for top executives, CEOs and CFOs have no effect on the size of the restatements. We find that incentives from restricted stock are related to the size of restatements for top executives, CEOs and CFOs, and that higher CFO equity holdings are related to larger restatements.

In addition, we do not find any evidence that firms raising more long-term debt and equity capital are more likely to misreport financial results in order to reduce the cost of external financing. In contrast to Johnson *et al*. (2009) and Erickson *et al*. (2006), top executives, CEOs and CFOs at restating Canadian firms do not exercise more options during the first year restated than their counterparts at control firms. However, we find that top executives and CEOs exercise more options during the first year restated when the magnitudes of the restatements are larger.

Our results provide guidance on designing compensation packages for executives. The compensation committee needs to find a balance between an increase in incentives to misstate financial results and the alignment of the interests of executives and shareholders. Our results should also be of interest to regulators in formulating disclosure regulations to minimize the occurrence of financial restatements.

The remainder of this chapter is organized as follows. Section 2 provides a brief review of the prior literature. Section 3 develops the hypotheses. Section 4 discusses the data and our sample selection.

[1] The ordered logistic regression or proportional odds model is a regression model for ordinal or dichotomous dependent variables, allowing for more than two (ordered) response categories such as bond ratings. The model only applies to data that meet the assumption that the relationship between any two pairs of outcome groups is statistically the same. Thus, the coefficients that describe the relationship between, for example, the lowest versus all higher categories of the dependent variable are the same as those that describe the relationship between the next lowest category and all higher categories of the dependent variable, and so forth.

Section 5 investigates the link between executive incentives and the likelihood of restatements. Section 6 analyzes the option exercises around with financial restatements. Section 7 concludes the paper.

2 PRIOR LITERATURE

Because of potential conflicts between managers and shareholders, one should link shareholder wealth with managerial compensation in order to reduce agency costs (Jensen and Meckling, 1976). One way to achieve this is to use equity compensation as suggested by the literature on optimal contracting (Core *et al*., 2003)**.** The use of stock options is usually viewed as a means to align the interests of shareholders with those of managers. Smith and Stulz (1985) argue that stock option compensation makes a manager's wealth a convex function of firm value such that a manager's risk aversion might be alleviated.

However, equity-based compensation can also have a negative impact. Jensen (2005) argues that overvalued stocks may lead to agency problems and stock-based compensation may exaggerate the problem because it encourages managers to engage in aggressive accounting to take advantage of short-run equity gains. Bergstresser and Philippon (2002) find higher levels of earnings management at a firm where the overall compensation of the CEO is closely tied to stock prices. Bebchuk and Fried (2003) show that equity ownership creates incentives for managers to choose projects that are less transparent or to move to reduce the transparency of existing projects.

Using 43 events of fraud from 1992 to 2001, Johnson *et al*. (2009) find that executives at such firms have greater incentives to misrepresent if they hold unrestricted stocks than do executives at matching firms. However, they do not find that such firms have greater incentives to commit fraud based on their holdings of restricted stocks, vested and unvested stock options. Based on their examination of executive incentives of firms accused of accounting fraud during 1996 and 2003 by the Securities and Exchange Commission (SEC) in their Accounting and Auditing Enforcement Releases (AAERs), Erickson *et al.* (2006) conclude that executive equity incentives are not associated with accounting fraud.

Two papers examine the relation between CEO compensation and the likelihood of financial restatements. Burns and Kedia (2006) find that the sensitivity of CEO option values to stock prices is positively related to the likelihood of financial misstatement over the period of 1995-2002. They do not find a significant relation between other components of CEO compensation (such as equity, restricted stocks, long-term incentive payouts, and salary plus bonus) and the propensity to misreport. Efendi *et al*. (2006) extend the study by Burns and Kedia (2006) by investigating whether in-the-money options provide additional incentives to misreport. They find that the likelihood of financial restatements is positively related to the value of the in-the-money stock options held by CEOs, the firm's interest-coverage ratio and whether the firm undertakes external financing. Given the link between earnings restatements and stock-based compensation, Cheng and Farber (2008) investigate whether restating firms recontract with their CEOs to reduce option-based compensation. Their results suggest that the proportion of the value of option grants over total compensation decreases in the two years following the restatement. The reduction in option-based compensation leads to a decrease in the riskiness of investment and therefore an increase in firm performance.

Baranowski (2010) examines the relation between restatements due to stock option backdating and certain risk characteristics. He finds that firms that restate due to option backdating have more material internal control weaknesses than control firms. He finds no evidence that CFO option values are related to the likelihood of restatement due to option backdating. Feng *et al*. (2011) examine why CFOs become involved in material accounting manipulations using Accounting and Auditing Enforcement Releases (AAERs).Their findings are consistent with the explanation that CFOs are involved in material accounting manipulations because of pressure from CEOs and not from them seeking immediate personal financial gain from equity incentives.

3 HYPOTHESES

Burns and Kedia (2006) argue that option compensation makes CEO wealth a convex function of stock price. As a result, a CEO benefits from an increase in the stock price due to misstated financial

statements. The loss to a CEO in the event of a declining stock price is limited because a CEO will choose not to exercise the options if they are not in-the-money. Cheng and Warfield (2005) suggest that managers with high equity incentives are more likely to engage in earnings management to increase the price of the stocks when sold. Therefore our first hypothesis, stated in its alternative form, is as follows:

H_A^1 : The incentives from stock options are positively related to the likelihood of restatements.

Stock options usually have a vesting period of three to five years, during which a proportion of the shares in the options are exercisable. Firms typically grant stock options each year, so the executives for any specific year hold a combination of vested and unvested options. Since executives can exercise vested options during periods of misstatements, our second hypothesis, stated in its alternative form, is as follows:

H_A^2 : The incentives from vested options are positively related to the likelihood of restatements.

Other components of executive compensation, such as restricted stocks, equity and long-term incentive payments, also link an executive's wealth to stock prices. Unlike stock options, executives will bear the cost of misstating the financial results since significant negative returns are associated with the announcement of financial restatements (Dechow *et al.*, 1996; Anderson and Yohn, 2002; Palmrose *et al.*, 2004). Burns and Kedia (2006) argue that long-term incentive payouts lengthen the executive's time horizon by making their wealth a function of longer-term firm performance. Our third hypothesis, stated in its alternative form, is as follows:

H_A^3 : The incentives from equity, restricted stocks and long-term incentive payouts are not related to the likelihood of restatements.

The cost of new capital raised externally depends on a firm's financial performance. This provides an incentive to misreport financial results. Dechow *et al.* (1996) and Richardson *et al.* (2003) find that an important reason for earning manipulations is the desire to attract low-cost external financing. Our fourth hypothesis, stated in its alternative form, is as follows:

H_A^4 : Restating firms are more likely to raise long-term debt and equity than control firms.

4 SAMPLE AND DATA

Restatement announcements for Canadian companies are identified using searches of Lexis-Nexis News Wires for the ten-year period from January 1997 to December 2006. Key word searches are performed using "restate," "restates," "restated," "restating," or "restatement" as well as other variations such as "adjust" and "amend" and "revise" within 50 words of "financial statement" or "earnings." Restatement announcements are excluded if they result from discontinued operations, stock splits, stock dividends, mergers and acquisitions,[2] changes in business segment definitions, changes made for presentation purposes, and changes in currency of reporting (for example, converting from Canadian to U.S. dollars). Restatements due to changes in accounting policy also are excluded as a general rule because they represent normal corporate activities which do not involve accounting fraud or errors.[3]

Our initial sample consists of 231 restatement announcements for firms listed on the Toronto Stock Exchange (TSX). The sample is reduced to 180 restatements after eliminating six firms with insufficient daily stock returns and closing prices in the Canadian Financial Markets Research Center (CFMRC) database, four firms with simultaneous trading halts and subsequent delistings, eighteen income funds, fifteen firms with multiple restatement announcements during the 250 trading days used for analysis purposes, and eight firms with unavailable proxy statements or with first proxy statements filed in the System for Electronic Document Analysis and Retrieval (SEDAR) whose dates follow the restatement announcements. We also exclude thirteen firms in the financial industry (SIC 60-67) since the

[2] For example, a firm restates its financial statements after completion of a merger where the merger was accounted for as a pooling of interests. We exclude this type of restatement because it is not associated with accounting fraud or error.

[3] We exclude firms adopting new accounting recommendations by the Canadian Institute of Chartered Accountants (CICA), Financial Accounting Standards Board (FASB) or the Emerging Issues Task Force (EITF). However, we include restatement announcements resulting from SEC clarifications of revenue recognition in financial statements (SEC Staff Accounting Bulletin No. 101) and lease accounting for operating lease (Feb.7, 2005, letter from SEC's Chief Accountant to American Institute of Certified Public Accounts clarifying SEC staff's interpretation of certain accounting issues and their application under GAAP relating to operating leases). To our knowledge, there are no restatements resulting from the changes of Canadian regulations.

interpretation of their ratios are different from other firms and their corporate governance is different due to regulation (Efendi *et al*., 2007). This reduces the sample to 167 restatements.

Following Agrawal *et al*. (1999), Agrawal and Chadha (2005) and Young *et al*. (2008), we match each restating firm with a unique control firm that (1) has the same two-digit Compustat primary Standard Industrial Classification (SIC) industry code,[4] (2) has the closest market capitalization to the restating firm at the end of the fiscal year before the announcement year,[5] and (3) did not announce any restatement during the period 1997 to 2006. A replacement firm is selected if the control firm announced a restatement within the sample period. We add an additional requirement that the match firm has disclosure about executive compensation in the proxy statements available in SEDAR to calculate executive compensation sensitivity. Market capitalization is measured as the monthly closing price times the number of shares outstanding, both of which are obtained from CFMRC. The procedure produces our final sample of 146 sample firms and 146 control firms.

The financial data for restating firms and control firms are obtained from the Compustat database. Missing data with the exception of sales growth are obtained from Mergent online or from the financial statements filed with SEDAR. The executive compensation variables are hand collected from the proxy statements at the year-end before the first year that was restated. The variables that are reported in U.S. dollars are converted into Canadian dollars using the I/B/E/S Daily Exchange Rate.

Summary characteristics for the restating firms differentiated by the reason for the restatement, the party initiating the restatement and industry groups based on primary two-digit SIC codes are reported in Panels A, B, and C of Table 1. Because some firms report multiple reasons for their restatements, the total number of reasons reported in Panel A exceeds the total sample size. Cost or expense is the most common reason (26.1%), followed by other (21.2%) and revenue recognition (18.8%). The frequencies differ from those reported for U.S. restatements (e.g., Anderson and Yohn, 2002; Palmrose *et al.*, 2004; Hribar and

[4]We use Bloomberg or Factiva to obtain any missing SICs for restating firms.
[5] For six restating firms who started trading on the TSX later than the end of the fiscal year before the year of the restatement announcements, the match date is the first trading month in the CFMRC.

Jenkins, 2004), where revenue recognition is the largest restatement category. Based on Panel B of table 1, the restatement initiators are unknown for 43.2% of the reinstatements, followed by company-initiated restatements for 34.9% of the reinstatements. Based on Panel C of table 1, 37.7% of the firms are in manufacturing, followed by 25.3% and 21.2% of the firms in mining and services, respectively. There are no financial restatements by firms in Agriculture, forestry, and fisheries, and construction. Based on Panel D of table 1, the mean sample firms restate more than one year of financial statements (mean=1.48). The magnitude or size of the restatements is measured as the cumulative effect of restatement on net income. It is calculated as the restated income (loss) less originally reported income (loss) over the restated period. This data are collected from the financial statements and the restatement announcements. The restatements, on average, reduce the annual net income by 438.52 million dollars. The size of a restatement is scaled by the total assets in the year prior to the restatement announcement. On average, restatements represent about 3% of total assets.

The restating firms are classified into five mutually exclusive groups for their financial constraint status using the algorithm by Hadlock and Piere (2010), whose details are provided in Appendix 1.[6] Based on Panel E of Table 1, 6.3% of the firms are not financially constrained (NFC), 23.8% of the firms are likely not financially constrained (LNFC), 58% of the firms are potentially financially constrained (PFC), 6.3% of the firms are likely financially constrained (LFC) and 5.6% of the firms are financially constrained.

[Please insert table 1 about here.]

[6] Three firms are not classified because the first year restated is before 1997. As a result, their financial statements are not available in SEDAR.

5 EXECUTIVE INCENTIVES AND THE INCIDENCE OF RESTATEMENT

5.1 Measurement of Executive Incentives

We define stock option sensitivity as the change in the value of a stock option for a 1% change in stock price. Consistent with the literature, we use the following modified Black-Scholes model adjusted for dividend payout by Merton (1973) to value the stock options.

$$Option\ Value = [Se^{-dT} N(Z) - Xe^{-rT} N(Z - \sigma T^{(1/2)})] \quad (1)$$

where $Z=[\log(S/X) + T(r-d+\sigma^2/2)]/\sigma T^{1/2}$; N is the cumulative probability function for the normal distribution; S is the price of the underlying stock; X is the exercise price of the option, T is the time-to-maturity of the option in years; *r* is the risk-free rate corresponding to the option's time-to-maturity; *d* is the natural logarithm of the expected dividend yield; and σ is the expected stock return volatility.

The stock price is the closing price at the fiscal year end before the first reporting year that is restated.[7] The Canadian Treasury bond average yield corresponding to the option's time-to-maturity is used as an estimate for the risk free rate. The bond yield is collected from the Canadian Socio-Economic Information Management System (CANSIM II). The average dividend yield (adjusted for stock splits) over the past three years prior to the first year that is restated is used as a proxy for the expected dividend yield. The expected stock return volatility is measured as the standard deviation of stock returns over 60 months prior to the first year restated.

For newly granted options, strike price and time to maturity are obtained directly from proxy statements. For previously granted options, the one-year approximation method of Core and Guay (1999, 2002) is used to estimate the strike price and the time to maturity. Time to maturity for unvested options is calculated as one year less than the time-to-maturity of the most recent year's grant (or nine years if no option is granted in the most recent year). Time to maturity for vested options is calculated as three years less than the time-to-maturity of unvested options (or six years if no option is granted in the most recent year). The average exercise prices for vested and unvested options are calculated as the year-end price

[7] Quoted closing mid-spreads are used as the proxies for any missing closing prices.

minus the profit per option. Profit per option is calculated as the realizable values disclosed in the proxy statement divided by the number of options at the fiscal year end.[8]

The sensitivity of the value of q stock option with respect to a 1% change in stock price is estimated as:

$$\partial(option\ value)/\partial(price)*(price/100) = e^{-dT}N(Z)*(price/100) \quad (2)$$

where $e^{-Dt}N(Z)$ is the partial derivative of the Black-Scholes value with respect to stock price (i.e., the option's delta); and all the other terms are as previously defined. The sensitivities of newly granted options, vested options and unvested options are estimated separately, and the sum of these three measures is the total option sensitivity.

Similar to Burns and Kedia (2006) and Erickson *et al*. (2006), the sensitivity of the value of stock and restricted stock is defined as the change in the value of these holdings for a 1% change in stock price. We assume that the delta of both restricted stock and stock is equal to one, which means that a one dollar change in stock price results in a one dollar change in the value of stock and restricted stocks. The sensitivity of stock (or restricted stock) is estimated by multiplying the number of shares of stock (or restricted stock) held by 1% of the stock price at the year-end before the first year that is restated.

The impact of payouts for Long-term Incentive Plans (LTIP) is measured as the LTIP payouts divided by total compensation. Total compensation is the sum of salary, bonus, other annual compensation, restricted stock grants, LTIP payouts, all other compensation and value of newly granted options using the modified Black-Scholes methodology.

For top executives, the incentive variables are calculated as the average over the top five executives listed in the proxy statements.[9] If firms have co-CEOs or two CEOs (CFOs) during the transition period, the incentive variables are summed over the co-CEOs or two CEOs (CFOs).

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[8] To avoid double counting the newly granted options, the number and realizable value of new options is deducted from the number and realizable value of unexercisable options. If the number of newly granted options exceeds the number of unexercisable options, the excess of the number and realizable value of the newly granted options over unexercisable options is deducted from the number and realizable value of exercisable options.

[9] Erickson *et al*. (2006) use the aggregated incentive variables over the entire management teams. We use the mean values instead of aggregated values because restating firms may report different numbers of executives from control firms (see Johnson *et al*., 2005).

5.2 Univariate Analysis

Table 2 presents the summary statistics of the financial variables for the restating and matched control firms. Both the median sales and total assets of control firms are significantly smaller than restating firms (*p*-value=0.09 and 0.00, respectively). The mean (median) leverage ratio is about 0.13 (0.06) for restating firms and 0.12 (0.03) for control firms. The mean (median) ROA is about -9.94% (-1.09%) for restating firms and -8.15% (0.36%) for control firms. However, we do not find that the restating firms are significantly more leveraged and have worse performance than control firms at the year-end prior to the first year that the financials are restated. Restating firms have a significantly higher mean sales growth rate (*p*-values=0.07) than control firms. Although restating firms, on average, raise more long-term debt than control firms, the difference is not statistically significant. Restating firms also raise more equity capital than control firms based on the median (*p*-value=0.06). Debt and equity funds raised is a dummy variable that is equal to one if the long-term debt and new equity raised during the first year restated exceeds 20% of total assets, and zero otherwise. Both the mean and median for this dummy variable are significant at the 5% level. Consistent with Efendi *et al*. (2007), restating firms issue more debt and equity funds than control firms during the first year restated. Restating firms have an insignificantly higher percentage of CEOs that are the chairs of their boards. Restating firms have the same percentage of CEOs belonging to the founding family as control firms. Consistent with Erickson *et al*. (2006), restating firms have significantly higher stock volatility than control firms (*p*-values for mean and median=0.01 and 0.03, respectively). Analyst following in number is obtained from I/B/E/S, and is assumed to be zero if the firm is not included in the I/B/E/S database. Restating firms are followed by more analysts (mean=4) than control firms (mean=2). Both the differences in the mean and median are statistically significant (*p*-values for mean and median=0.00 and 0.00, respectively).

[Please insert table 2 about here.]

Table 3 presents the descriptive statistics for executive compensation and incentive measures for the restating and control firms. Panel A reports the variables for top executives, measured at the year-end

before the first restated year. The average salaries of top executives are $241,807 for restating firms, and $188,001 for the control firms. The difference in the means is marginally significant (*p*-value=0.07). Restating firms' top executives also have higher bonuses than their control firm counterparts. However, the differences are not statistically significant for both the mean and the median. The mean restricted stock grants for top executives at restating firms of $27,236 is significantly different from the $3,438 for control firms (*p*-value=0.06).

The option grant value is calculated using the modified Black-Scholes model adjusted for dividend payouts, where the number of options granted is taken from the proxy statements. The in-the-money option is the value that executives would have realized from exercising all vested and unvested options. Total compensation is the sum of salary, bonus, other annual, long-term incentive payouts, other compensation, option grant value and restricted stock grant value. Top executives at restating firms have higher values of granted options, in-the-money options, and total compensations than at control firms. However, none of the differences are statistically significant.

Total options sensitivity is the sum of newly granted stock options sensitivity, vested option sensitivity and unvested option sensitivity. Total sensitivity is the sum of total options sensitivity, restricted stocks sensitivity and equity sensitivity. The mean vested option sensitivity, unvested option sensitivity and total option sensitivity are insignificantly higher for top executives at restating firms than at control firms. The mean restricted stock sensitivity of $158.0 for restating firms is significantly different (marginally) from the mean sensitivity of restricted stock of $20.6 for the control firms. Although equity sensitivity and total sensitivity for top executives are higher for control firms than restating firms, the differences are not statistically significant.

Panels B and C in Table 3 report summary statistics for the compensation and incentives variables for only CEOs and only CFOs, respectively. The number of observations for Panels B and C are lower than for Panel A due to the exclusion of firms where CEO or CFO compensations are not disclosed in the proxy statements. Similar to top executives, CEOs at restating firms have marginally higher mean salary (*p*-value=0.10), marginally higher restricted stock grants (*p*-values=0.08 and 0.06 for mean and median

differences, respectively) and higher mean restricted stock sensitivities (*p*-value=0.09) than at control firms. The other compensation variables and incentive measures are not significantly different from each other. For CFOs, none of the variables is statistically significant.

[Please insert table 3 about here.]

5.3 Logistic Regression

In this section, we examine whether the differences in incentive measures are associated with the likelihood of restatement after controlling for other determinants. We estimate the following logistic regression:

RESTATE=*f* (Total option sensitivity or Vested option sensitivity and unvested option sensitivity, Restricted stock sensitivity, Equity sensitivity, Long-term incentive plans (LTIP) payouts, Capitalraise, Volatility, CEOCHAIR, CEOFOUND, Leverage, Sales growth), (3)

where RESTATE is a dummy variable that is equal to one if the firm is a restating firm and zero if the firm is a control firm. We use the logarithmic transformation for the option incentive measures, because these measures increase at a decreasing rate with firm size according to Baker and Hall (1998) and Core and Guay (1999). Total option sensitivity is the natural logarithm of the dollar change in the value of total stock options holdings, including newly granted options, vested options and unvested options, for a 1% change in stock price. Vested and unvested option sensitivity is the dollar change in the value of the holdings of vested and unvested options for a 1% change in stock price. Equity and restricted stock sensitivity is the dollar change in the value of equity and restricted stock holdings for a 1% change in stock prices. Long-term incentive payment is calculated as the long-term incentive payments divided by total compensation. All the incentive variables are measured in the year prior to the first year restated.

Capitalraise is a dummy variable that is equal to one if the long-term debt and new equity raised during the first year restated exceeds 20% of total assets, and zero otherwise. Firms may manipulate the earnings in order to attract low cost external funding (Dechow *et al*., 1996; Richardson *et al*., 2002). We hypothesize a positive relation between the amount of debt and equity raised and the incidence of

restatement. Volatility is calculated as the standard deviation of stock returns over the 60 months prior to the first year restated. Firms operating in less predictable environments are more difficult to monitor, and therefore find it easier to commit financial fraud (Erickson *et al*., 2006). We hypothesize a positive relation between volatility and the likelihood of restatement. CEOCHAIR is a dummy variable that is equal to one if the CEO is also the Board Chair and zero otherwise. The board's monitoring function is less effective when the CEO is also the Board Chair (Jensen, 1993; Beasley, 1996; Dechow *et al*., 1996), so we hypothesize a positive relation between CEOCHAIR and the likelihood of restatement. CEOFOUND is a dummy variable that is equal to one if the CEO belongs to the founding family of the firm and zero otherwise. Dechow *et al*. (1996) argue that CEOs are less accountable to the board when they are also the company founders. We hypothesize that the likelihood of restatement is higher for firms with CEOs that belong to the founding family. Leverage is calculated as the ratio of total Long-term debt divided by total assets at the year-end before the first year restated. Leverage is a proxy for the firm's demand for external financing which may explain why earnings are manipulated to avoid debt covenant violations (Dechow *et al*., 1996). We therefore hypothesize a positive relation between leverage and the likelihood of restatement. Sales growth is calculated as the compound growth rate of sales in the three years preceding the first year restated. Richardson *et al*. (2002) note that restatement firms are associated with high growth rates because they are under great pressure to inflate the earnings to meet expectations of analysts. We hypothesize a positive relation between growth rates and the incidence of restatement.

The logistic regression results are reported in Table 4. Panels A and B present the model results when the control variables are not included. Contrary to the first hypothesis and the results of Burns and Kedia (2006), total option sensitivities with respect to stock price for CEOs are not significantly positively related to the likelihood of restatements. We do not find any evidence that the total option sensitivity of top executives and CFOs are positively associated with the probability of restatements. In contrast to the second hypothesis and the findings of Burns and Kedia (2006), the incentives from vested options are not significantly related to the likelihood of restatements for top executives, CEOs and CFOs. Consistent with our third hypothesis, incentives from equity and long-term incentive payouts are not associated with the

likelihood of restatements for top executives, CEOs and CFOs. However, restricted stock sensitivities are positively related to the incidence of restatements for top executives.

[Please insert table 4 about here.]

Panels C and D of Table 4 present the model results when the control variables are included. Even after controlling for other determinants, the incentives from total options and vested options are not associated with a higher likelihood to restate for top executives, CEOs, and CFOs. This is in contrast to our first hypothesis and the findings of Burns and Kedia (2006), but consistent with Erickson *et al*. (2006). We find no evidence that unvested option sensitivity is related to the likelihood of restatements. Restricted stock holdings, equity holdings and long-term incentive payouts are not associated with a higher likelihood of restatement. This is consistent with our third hypothesis and the findings of Burns and Kedia (2006). Consistent with the univariate analysis, firms with higher stock return volatility (except for CEOs) and higher sales growth rates are more likely to restate. However, there is no evidence that more levered firms and those with the CEO also being the Chair of the Board or belonging to the founding family have a higher probability of restatements. In contrast to our fourth hypothesis, we do not find that restating firms are more likely to raise long-term debt and equity capital than control firms during the first year restated since none of the coefficients for dummy variable Capitalraise is significant.

5.4 Ordinal logistic regression

In the previous section, we do not distinguish the prompters (initiators) for all restatements. We now run a logistic regression using an ordinal dependent variable to control for the restatement severity since some of the restatements are voluntary while others are mandated by the regulator or auditor. Similar to Efendi *et al*. (2007), we define a firm having accounting malfeasance if either the regulator or auditor prompted the restatement. The ordinal dependent variable is equal to two if the firm has accounting malfeasance, one for all other restatements, and zero for control firms. The explanatory variables are the same as in the previous section.

The ordinal logistic regression results, which are reported in Table 5, are very similar to those in Table 4. The option sensitivities (total, vested and unvested) are not related to the incidence of restatements due to accounting malfeasance. Except for the equity holdings of CEOs, restricted stock, equity holdings and long-term incentive payouts are not associated with the likelihood of restatements due to accounting malfeasance for top executives, CEOs and CFOs. Firms with higher stock return volatilities (except for CEOs) and higher sales growth rates (except for CFOs) are more likely to be associated with restatements due to accounting malfeasance. More levered firms and those with the CEO as the Chair of the Board or belonging to the founding family are not related to the likelihood of restatements due to accounting malfeasance.

[Please insert table 5 about here.]

5.5 The impact of option sensitivity on the size of the restatement

Burns and Kedia (2006) find that misreporting earnings that are substantially restated is more likely to be associated with CEOs with large option sensitivity. Although we do not find a relation between the likelihood of restatement and option sensitivity, option sensitivity may still be related to the size of the restatements.

The size of a restatement is measured as the cumulative impact of a restatement on net income and is calculated as the restated net income less the originally reported net income over the restated period. The values are scaled by the total assets in the year prior to the restatement announcements. For control firms, the size of the restatement is zero. Thus, the dependent variable is the absolute value of the cumulative effect of a restatement on net income scaled by total assets. The regression results are reported in Table 6. None of the coefficients of total option sensitivity are significant for top executives, CEOs and CFOs. This suggests that option sensitivity has no impact on the magnitude of restatements. Similarly, we do not find that incentives from restricted stock are related to the magnitude of restatement for top executives, CEOs and CFOs. Although there is no evidence that incentives from top executives and CEO equity

holdings are associated with the magnitude of restatement, we find large restatements are associated with higher CFO equity sensitivity.

[Please insert table 6 about here.]

6 OPTION EXERCISES

In this section, we examine exercise behavior for executive options. Panels A, B and C of Table 7 report the dollar values of options exercised and the ratios of the number of exercised options to total number of exercisable options during the first year restated for top executives, CEOs and CFOs, respectively. The mean value of options exercised for top executives at restating firms and control firms is 1,054,092.4 and 227,568.8, respectively, whose difference is not significant. The top executives of restating firms exercise 91% of exercisable options compared to 9% for their counterparts at the control firms. However, the difference again is not statistically significant. The CEOs for restating firms have a marginally significant and higher mean value of options exercised and a higher percentage of exercised options to the total number of exercisable options (*p*-value=0.10 and 0.06, respectively). In contrast, the mean value of options exercised and ratio of exercised options to total number of exercisable options are not significantly different for CFOs at restating firms from those at control firms.

We now run a regression to control for the other factors that might affect option exercises. The dummy variable RESTATE is equal to one if the firm is a restating firm and zero if the firm is a control firm. The results are reported in Panel D of Table 7. The results suggest that the value of exercised options for top executives is positively related to the value of the in-the-money options and the magnitude of restatement. Consistent with Efendi *et al.* (2007), we also find that the value of exercised options for CEOs increases with the value of in-the-money options. Furthermore, we find that CEOs exercise more options when the magnitude of restatement is higher. The results also indicate that similar to top executives and CEOs, the value of options exercises increases with the value of in-the-money options for CFOs. CFOs also exercise more options when they have higher salaries. However, none of the coefficients for the dummy variable RESTATE are statistically significant for top executives, CEOs and

CFOs. Our overall results suggest that consistent with Erickson *et al*. (2006), top executives, CEOs and CFOs at restating firms do not exercise more options than at control firms during the first year subsequently restated.

[Please insert table 7 about here.]

7. CONCLUSION

We examine the effects of executive equity incentives on the propensity to misstate financial statements for a sample of 146 firms listed on the Toronto Stock Exchange who announced financial restatements during the period from 1997 to 2006 and for 146 control firms. We find that the likelihood of restatements is unrelated to the sensitivity of total, vested and unvested options for top executives, CEOs and CFOs. The incentives from equity, restricted stocks and long-term incentive payouts are not associated with the incidence of restatements for top executives, CEOs and CFOs. .

After controlling for the different prompters of restatements, we find the option sensitivities (total, vested and unvested) are not related to the incidence of restatements due to accounting malfeasance. Except for the equity holdings of CEOs, restricted stock, equity holdings and long-term incentive payouts are not associated with the likelihood of restatements due to accounting malfeasance for top executives, CEOs and CFOs.

We also find that option sensitivities for top executives, CEOs and CFOs have no effect on the magnitude of restatements. Similarly, incentives from restricted stock are unrelated to the magnitude of restatements for top executives, CEOs and CFOs. Higher CFO equity holdings are associated with bigger restatements.

In addition, we do not find any evidence that firms raising more long-term debt and equity capital are more likely to misreport financial results in order to reduce the cost of external financing. Top executives, CEOs and CFOs at restating firms do not exercise more options during the first year restated and have more holdings of in-the-money stock options than control firms. Top executives and CEOs also exercise more options during the first year restated when the magnitudes of restatements are higher.

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Table 1. Descriptive statistics for restating firms

This table reports the characteristics of 146 Canadian financial restatements during the period 1997-2006. The total number of reasons exceeds the total number of restatements because some restatements involve more than one reason. Size of restatement is the cumulative impact of restatements on net income in millions of dollars. It is scaled by the total assets in the year prior to the restatement announcement. Financial constraint status is classified as five mutually exclusive groups: not financially constrained (NFC), likely not financially constrained (LNFC), potentially financially constrained (PFC), likely financially constrained (LFC), and financially constrained (FC).

Panel A: Reason for restatement		
Reason for Restatement	**Number**	**Frequency (%)**
Cost or expense	43	26.06
Other	35	21.21
Revenue recognition	31	18.79
Securities related	23	13.94
Reclassification	9	5.45
Restructuring, assets or inventory	15	9.09
Acquisition or merger	6	3.64
Related-party transaction	2	1.21
In-process research and development	1	0.61
Total	165	100.0
Panel B: Initiating parties of the restatements		
Initiators	**Number**	**Frequency (%)**
Company	51	34.93
Auditor	13	8.90
Company and Auditor	14	9.59
Regulator	1	0.68
Other	4	2.74
Unknown	63	43.15
Total	146	100.0
Panel C: Industry distribution		
Industry and 2 digit SIC code	**Number**	**Frequency (%)**
Agriculture, forestry, and fisheries (01-09)	0	0.00
Mining (10-14)	37	25.34
Construction (15-17)	0	0.00
Manufacturing (20-39)	55	37.67
Transportation, Communications, & Utility Services (40-49)	12	8.22
Wholesale Trade (50-51)	3	2.05
Retail Trade (52-59)	8	5.48
Services (70-89)	31	21.23
Total	146	100.0

Table 1. Continued

Panel D: Other characteristics of restatements		
	Mean	**Median**
Number of years restated	1.479	1
Size of restatement	-438.523	-0.405
Size of restatement/total assets	-0.031	-0.005
Panel E: Financial constraint categories		
	Number	**Frequency (%)**
Not financially constrained (NFC)	9	6.29
Likely not financially constrained (LNFC)	34	23.78
Potentially financially constrained (PFC)	83	58.04
Likely financially constrained (LFC)	9	6.29
Financially constrained (FC)	8	5.59

Table 2. Summary statistics for sample and control firms

This table reports summary statistics of financial variables for restating and control firms. The variables are defined in the body of the paper. Sales, total assets, long-term debt raised and equity raised are in millions of dollars. Sales growth and Return on Assets (ROA) is in percent. Debt and equity funds raised is a dummy variable that is equal to one if the long-term debt and new equity raised during the first year restated exceeds 20% of total assets, and zero otherwise. CEOCHAIR is a dummy variable that is equal to one if the CEO is also the Board Chair and zero otherwise. CEOFOUND is a dummy variable that is equal to one if the CEO belongs to the founding family of the firm and zero otherwise. We assume that the number of analyst following is zero if the firm is not in the IBES database. Volatility is calculated as the standard deviation of stock returns over the 60 months prior to the first year restated. The reported *p*-value is for two-tailed *t*-test for the difference in means and Wilcoxon signed rank test for the difference in medians, respectively. ***, ** and * indicate significance at 0.01, 0.05 and 0.10 levels, respectively.

	Mean			Median			Sample
Variable	Sample	Control	*p*-value	Sample	Control	*p*-value	Size
Sales	1250.69	1199.76	0.88	48.52	43.92	0.09*	145
Total assets	2006.42	1184.42	0.13	77.91	62.92	0.00***	145
Total long-term debt/total assets	0.127	0.117	0.52	0.063	0.026	0.38	145
Sales growth	25.12	12.24	0.07*	15.33	9.57	0.11	57
ROA	-9.937	-8.152	0.61	-1.089	0.361	0.29	145
Long-term debt raised	74.37	66.17	0.80	0.00	0.00	0.80	146
Equity raised	27.73	35.14	0.61	3.58	0.45	0.06*	146
Debt and equity funds raised	0.390	0.274	0.03**	0.00	0.00	0.03**	146
CEOCHAIR	0.384	0.377	0.91	0.00	0.00	0.91	146
CEOFOUND	0.349	0.349	1.00	0.00	0.00	1.00	146
Number of analysts following	3.77	2.12	0.00***	1.20	0.00	0.00***	146
Volatility	0.090	0.078	0.01***	0.082	0.075	0.03**	107

Table 3. Summary compensation statistics for sample and control firms

This table reports summary statistics of compensation and incentive variables for restating and control firms. The variables are defined in the body of the paper and reported in thousands of dollars except for in-the-money options to salary. The variables are measured at the fiscal year-end before the first year restated. The sample size for CEO only and CFO only is less than the full sample size because CEO or CFO compensations are not disclosed in a firm's proxy statements. The reported *p*-value is for a two-tailed *t*-test for a difference in means and Wilcoxon signed rank test for the difference in medians, respectively. ***, ** and * indicate significance at 0.01, 0.05 and 0.10 levels, respectively.

	Mean			Median			Sample Size
Variable	Sample	Control	*p*-value	Sample	Control	*p*-value	
Panel A: Top executives							
Salary	241.807	214.684	0.07*	188.001	185.673	0.23	146
Bonus	123.277	115.976	0.80	34.097	17.500	0.14	146
Option grant	4020.033	191.410	0.29	5.502	3.498	0.93	146
Restricted stock grant	27.236	3.438	0.06*	0.000	0.000	0.04**	146
In-the-money option	8234.193	1093.270	0.26	96.418	51.086	0.69	146
In-the-money option to salary	18.66	2.80	0.28	0.46	0.27	0.32	137
Total compensation	4477.154	663.730	0.29	299.488	268.188	0.16	146
Vested option sensitivity	35.428	11.325	0.20	1.531	1.738	0.75	146
Unvested option sensitivity	24.932	8.458	0.21	0.008	0.100	0.62	146
Total option sensitivity	108.326	24.336	0.24	3.481	4.287	0.81	146
Restricted stock sensitivity	0.158	0.021	0.07*	0.000	0.000	0.11	146
Equity sensitivity	66.450	279.152	0.23	4.267	5.817	0.46	146
Total sensitivity	174.934	303.508	0.50	13.178	17.830	0.40	146

Table 3. Continued

Panel B: Chief Executive Officer (CEO) only							
Salary	364.153	314.664	0.10*	251.945	252.269	0.27	140
Bonus	259.946	286.494	0.76	49.000	4.144	0.53	140
Option grant	15114.353	408.767	0.31	3.782	0.000	0.85	140
Restricted stock grant	57.090	8.674	0.08*	0.000	0.000	0.06*	140
In-the-money option	30702.690	2733.824	0.28	76.500	15.050	0.48	140
In-the-money option to salary	64.41	5.8	0.30	0.35	0.08	0.52	126
Total compensation	15914.397	1174.075	0.30	423.650	357.375	0.39	140
Vested option sensitivity	136.939	27.358	0.23	1.960	2.243	0.82	140
Unvested option sensitivity	64.199	21.570	0.24	0.000	0.000	0.47	140
Total option sensitivity	377.918	59.405	0.27	5.419	5.563	0.65	140
Restricted stock sensitivity	0.397	0.072	0.09*	0.000	0.000	0.15	140
Equity sensitivity	216.051	135.829	0.58	9.866	13.210	0.17	140
Total sensitivity	594.366	195.305	0.24	28.292	35.926	0.13	140
Panel C: Chief Financial Officer (CFO) only							
Salary	207.429	187.066	0.16	176.125	162.135	0.13	74
Bonus	99.057	94.255	0.89	41.600	14.564	0.11	74
Option grant	2755.523	128.245	0.30	0.000	0.001	0.78	74
Restricted stock grant	11.469	8.194	0.73	0.000	0.000	0.84	74
In-the-money option	6435.232	554.541	0.29	43.230	24.500	0.67	74
In-the-money option to salary	18.99	2.07	0.29	0.18	0.18	0.64	70
Total compensation	3106.243	483.381	0.30	255.894	217.706	0.24	74
Vested option sensitivity	18.578	5.537	0.23	0.665	0.731	0.90	74
Unvested option sensitivity	30.243	5.897	0.28	0.163	0.123	0.72	74
Total option sensitivity	81.504	14.481	0.28	1.933	2.610	0.66	74
Restricted stock sensitivity	0.192	0.041	0.22	0.000	0.000	0.38	74
Equity sensitivity	18.203	2.380	0.36	0.000	0.000	0.21	74
Total sensitivity	99.899	16.902	0.29	3.184	3.121	0.95	74

Table 4. Logistic regression of the likelihood of restatement

This table reports the results of the following logistic regression:
RESTATE=*f* (Total option sensitivity or Vested option sensitivity and unvested option sensitivity, Restricted stock sensitivity, Equity sensitivity, Long-term incentive plans (LTIP) payouts, Capitalraise, Volatility, CEOCHAIR, CEOFOUND, Leverage, Sales growth),
where RESTATE is a dummy variable that is equal to one if the firm is a restating firm and zero if the firm is a control firm. Total option sensitivity is the dollar change in the value of total stock options holdings (including newly granted options, vested options and unvested options) for a 1% change in stock price. Vested and unvested option sensitivity is dollar change in the value of vested and unvested options holdings for a 1% change in stock price. Equity and restricted stock sensitivity is dollar change in the value of equity and restricted stock holdings for a 1% change in stock price. Long-term incentive payout incentive is calculated as long-term incentive payout divided by total compensation. Leverage is calculated as the ratio of total Long-term debt divided by total assets at the year-end before the first year restated. Volatility is calculated as standard deviation of stock returns over 60 months prior to the first year restated. Sales growth is calculated as the compound growth rate of sales in the three years preceeding the first year restated. CEOCHAIR is a dummy variable that is equal to one if the CEO is also the Board Chair and zero otherwise. Capitalraise is a dummy variable that equals one if the long-term debt and new equity raised during the first year restated exceeds 20% of total assets, and zero otherwise. ***, ** and * indicate significance at 0.01, 0.05 and 0.10 levels, respectively.

	Top Executives		CEO		CFO	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Panel A: Model 1						
Intercept	0.0498	0.49	-0.0736	0.63	-0.1206	0.30
Total option sensitivity	0.0048	0.64	0.0087	0.54	0.0009	0.94
Restricted stock sensitivity	0.0005	0.03**	0.0002	0.18	0.0004	0.11
Equity sensitivity	-0.000	0.04**	0.0000	0.58	0.0000	0.26
LTIP incentive	0.6345	0.81	0.6707	0.80	2.3040	0.47
Pseudo R^2	0.015		0.010		0.014	
Panel B: Model 2						
Intercept	0.1846	0.39	0.0770	0.69	-0.248	0.91
Vested option sensitivity	-0.0445	0.20	-0.0221	0.45	-0.0246	0.56
Unvested option sensitivity	0.0196	0.27	0.0134	0.40	0.0122	0.42
Restricted stock sensitivity	0.0005	0.14	0.0002	0.18	0.0004	0.21
Equity sensitivity	-0.0000	0.35	0.0000	0.53	0.0000	0.50
LTIP incentive	0.2524	0.92	0.5690	0.83	2.0567	0.59
Pseudo R^2	0.021		0.014		0.020	

Table 4. Continued

Panel C: Model 3						
Intercept	-0.9981	0.06*	-0.7886	0.13	-1.3231	0.02**
Total option sensitivity	0.0122	0.59	0.0139	0.52	0.0049	0.77
Restricted stock sensitivity	0.0005	0.18	0.0001	0.19	0.0004	0.23
Equity sensitivity	-0.0000	0.44	0.0000	0.60	0.0000	0.69
LTIP incentive	6.3637	0.20	0.3173	0.91	0.8825	0.87
Capitalraise	0.4640	0.26	0.4942	0.23	0.4263	0.37
Leverage	-0.3491	0.72	-0.3564	0.72	0.4165	0.72
Volatility	9.1066	0.08*	7.3972	0.14	9.8840	0.10*
Sales growth	0.0093	0.04**	0.0103	0.03**	0.0094	0.09*
CEOCHAIR	-0.2604	0.49	-0.4059	0.29	-0.1451	0.75
CEOFOUND	-0.0498	0.89	-0.0806	0.83	0.2285	0.62
Pseudo R^2	0.078		0.071		0.067	
Panel D: Model 4						
Intercept	-0.9737	0.11	-0.7874	0.17	-1.1257	0.09*
Vested option sensitivity	0.0091	0.88	0.0164	0.71	-0.0357	0.56
Unvested option sensitivity	0.0031	0.87	0.0007	0.96	0.0176	0.52
Restricted stock sensitivity	0.0005	0.18	0.0001	0.19	0.0004	0.22
Equity sensitivity	-0.0000	0.43	0.0000	0.61	0.0000	0.22
LTIP incentive	6.2976	0.20	0.2915	0.92	0.2625	0.96
Capitalraise	0.4655	0.26	0.4968	0.23	0.4090	0.39
Leverage	-0.3451	0.72	-0.3514	0.72	0.4535	0.70
Volatility	9.0704	0.08*	7.4309	0.11	9.5669	0.11
Sales growth	0.0093	0.04**	0.0103	0.03**	0.0010	0.08*
CEOCHAIR	-0.2614	0.50	-0.4216	0.28	-0.1624	0.72
CEOFOUND	-0.0555	0.88	-0.0857	0.82	0.2429	0.59
Pseudo R^2	0.079		0.072		0.073	

Table 5. Ordinal logistic regression models

This table reports the results of ordinal logistic regressions. The ordinal dependent variable is coded as two if the restatements are prompted by a regulator or auditor, one for all the other restatements, and zero for control firms. All the explanatory variables are the same as those defined in Table 4. ***, ** and * indicate significance at 0.01, 0.05 and 0.10 levels, respectively.

	Top Executives		CEO		CFO	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Panel A: Model 1						
Intercept 1	-4.3837	0.00***	-4.3138	0.00***	-4.4943	0.00***
Intercept 2	-0.9440	0.07*	-0.7283	0.15	-1.3278	0.02**
Total option sensitivity	0.0162	0.55	0.0161	0.50	0.0054	0.76
Restricted stock sensitivity	0.0003	0.20	0.0001	0.25	0.0003	0.29
Equity sensitivity	-0.0000	0.47	0.0000	0.04**	0.0000	0.70
LTIP incentive	5.5077	0.24	0.3270	0.90	0.8527	0.87
Capitalraise	0.4328	0.27	0.4323	0.28	0.4744	0.30
Leverage	-0.3164	0.74	-0.3211	0.74	0.4514	0.69
Volatility	8.1378	0.09*	6.7453	0.15	10.1971	0.08*
Sales growth	0.0052	0.06*	0.0054	0.06*	0.0047	0.12
CEOCHAIR	-0.1255	0.73	-0.2924	0.43	-0.0079	0.99
CEOFOUND	-0.0327	0.93	-0.1106	0.76	0.2047	0.64
Pseudo R^2	0.052		0.062		0.047	
Panel B: Model 2						
Intercept 1	-4.3722	0.00***	-4.2737	0.00***	-4.3118	0.00***
Intercept 2	-0.9314	0.11	-0.6880	0.21	-1.1353	0.08*
Vested option sensitivity	0.0163	0.77	0.0138	0.75	-0.0360	0.54
Unvested option sensitivity	0.0013	0.95	0.0013	0.93	0.0208	0.62
Restricted stock sensitivity	0.0003	0.20	0.0001	0.25	0.0003	0.28
Equity sensitivity	0.0000	0.46	0.0000	0.04**	0.0000	0.67
LTIP incentive	5.4508	0.24	0.2826	0.92	0.2211	0.97
Capitalraise	0.4335	0.28	0.4341	0.27	0.4693	0.31
Leverage	-0.3160	0.74	-0.3390	0.72	0.4639	0.68
Volatility	8.1421	0.09*	6.7097	0.15	9.8899	0.09*
Sales growth	0.0052	0.06*	0.0054	0.06*	0.0049	0.11
CEOCHAIR	-0.1320	0.72	-0.2993	0.42	-0.0134	0.98
CEOFOUND	-0.0347	0.92	-0.1207	0.74	0.2117	0.63
Pseudo R^2	0.052		0.062		0.053	

Table 6. The impact of option sensitivity on size of restatements

This table reports the regression results. The dependent variable is the absolute value of the cumulative effect of restatements on net income scaled by total assets in the year prior to the year of restatement announcements. Total option sensitivity is the dollar change in the value of total stock options holdings for a 1% change in stock price. Vested and unvested option sensitivity is dollar change in the value of vested and unvested options holdings for a 1% change in stock price. Equity and restricted stock sensitivity is dollar change in the value of equity and restricted stock holdings for a 1% change in stock price. Long-term incentive payout incentive is calculated as long-term incentive payout divided by total compensation. Leverage is calculated as the ratio of total Long-term debt divided by total assets at the year-end before the first year restated. Volatility is calculated as standard deviation of stock returns over 60 months prior to the first year restated. Sales growth is calculated as the compound growth rate of sales in the three years preceeding the first year restated. ***, ** and * indicate significance at 0.01, 0.05 and 0.10 levels, respectively.

	Top Executives		CEO		CFO	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Intercept	0.0102	0.73	0.0105	0.72	-0.0009	0.91
Total option sensitivity	0.0005	0.55	0.0006	0.51	0.0000	0.85
Restricted stock sensitivity	0.0000	0.92	0.0000	0.87	0.0000	0.85
Equity sensitivity	0.0000	0.94	0.0000	0.75	0.0000	0.00***
LTIP incentive	-0.0284	0.92	-0.0247	0.88	-0.0110	0.88
Leverage	-0.0525	0.39	-0.0528	0.40	0.0088	0.57
Volatility	0.0587	0.84	0.0467	0.87	0.0663	0.40
Sales growth	0.0003	0.06*	0.0003	0.05**	0.0000	0.80
Adjusted R^2	0.03		0.04		0.04	

Table 7. Option exercises by executives

This table reports summary statistics of executive option exercises during the first year restated and regression results for restating and control firms. In-the-money options is the sum of the value of exercisable options and unexercisable options. RESTATE is a dummy variable that is equal to one if the firm is a restating firm and zero if the firm is a control firm. ***, ** and * indicate significance at the 0.01, 0.05 and 0.10 levels, respectively.

	Mean			Median		
Variable	Sample	Control	*p*-value	Sample	Control	*p*-value
Panel A: Top executives						
Value of Options exercises	1054092.4	227568.8	0.13	0	0	0.17
No of exercised options/vested options	0.91	0.09	0.24	0	0	0.08*
Panel B: Chief Executive Officer (CEO) only						
Value of Options exercises	3497017.7	269843.4	0.10*	0	0	0.49
No of exercised options/vested options	0.17	0.09	0.06*	0	0	0.22
Panel C: Chief Financial Officer (CFO) only						
Value of Options exercises	972550.5	132394.9	0.27	0	0	0.32
No of exercised options/vested options	1.61	0.11	0.27	0	0	0.10*
Panel D: regression with options exercises						
	Top executives		CEO		CFO	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Intercept	-369116	0.74	-2261702	0.15	368603	0.29
Ln(Asset)	16912	0.82	113903	0.17	-25542	0.23
Salary	0.468	0.77	0.649	0.72	0.741	0.02**
Bonus	-1.313	0.27	-2.559	0.17	0.211	0.46
In-the-money option	0.308	0.00***	0.356	0.00***	0.131	0.00***
RESTATE	116562	0.41	505830	0.06*	20184	0.67
Size of Restatement	3427	0.00***	16315	0.00***	-24.60	0.78
Adjusted R^2	0.94		0.95		0.99	
Observations	292		286		198	

Appendix 1. Categorization of Financial constraints by Hadlock and Piere (2010)

Following Hadlock and Piere (2010) and Kaplan and Zingles (1997), we collect information on financial constraints by reading annual reports and financial statements filed with SEDAR. In particular, we read annual letters to shareholders and the management discussion and analysis section for both restating firms and control firms in the fiscal year before the first year restated. We also perform keyword searches of the annual reports and/or financial statements by using "financing", "finance", "investing", "invest", "capital", "liquid", "liquidity", "covenant", "amend", "waive", "violate", and "credit". We extract every statement that is related to the firm's ability to raise funds or finance its current or future operations. For many firms, we have multiple statements. Similar to Hadlock and Piere (2010), we assign each statement to one of the five categories from 1 to 5, where lower (higher) numbers indicates a lack of (presence) of financial constraints.

The statements that indicate that a firm has excess or more than sufficient liquidity to fund its capital needs are assigned to category 1. Statements using the word "strong" or a similar adjective when describing a firm's financial position are also assigned to this category. Examples of statements that are assigned to category 1 include: "The company is well positioned to continue its growth, with a strong balance sheet and significant unused debt capacity and credit facilities," and "management believes that the Company's liquid assets are more than sufficient to fund planned operating and project development and sustaining capital expenditures and discharge liabilities as they come due". We assign the statements to category 2 which indicate a firm has adequate or sufficient liquidity to fund its needs. The main difference between category 1 and category 2 is the strength of the language. Examples of statements that are assigned to category 2 include: "The Company believes that it will be able to generate sufficient cash flow to meet its current and future working capital, capital expenditure and debt obligation requirements," and "The Company has adequate resources to finance operating needs over the business cycle as well as its growth and strategic objectives."

The statements that are opaque and therefore difficult to classify into other categories are assigned to category 3. Category 3 also includes statements that are soft warnings regarding a firm's future liquid

position if certain scenarios were to happen. The feature of category 3 is that the statements not only do not indicate any financial strength but also do not indicate any current liquidity problems. Examples of statements that are assigned to category 3 include: “Although the Company has been successful in obtaining financing to date, there can be no assurance that the Company will be able to obtain adequate financing in the future or that the terms of financing will be favorable,” and “In order to achieve its long term development and commercialization strategy, the Corporation will need to raise additional capital through the issuance of shares or collaboration agreements or partnerships that would allow the Corporation to finance its activities. Nothing guarantees that additional funds will be available or that they may be acquired according to acceptable terms and conditions, allowing the Corporation to successfully market its products.”

The statements that indicate current some liquidity problem such as having difficulty in obtaining finance, but with no direct direction that these problems have affected the investment decisions are assigned to category 4. Examples of statements coded as category 4 include: “We may incur substantial losses in the future that could make financing our operations and business strategy more difficult,” and “During the year, however, as prospects for economic growth in a number of the major global economies declined, metal inventories rose, mines began to close and capital available for lending for the development of new mine projects tightened. Consequently the Company decided to defer financing the development of the Magellan Project until these factors improved.”

The statements that are assigned to category 5 indicate clear financial problems or constraints such as in violation of debt covenants, has been cut out of usual source of capital, is renegotiating debt payments, is forced to reduce investment because of liquidity problems. Example of statements coded as 5 include: “Under the terms of the company’s banking agreement, the company must meet certain stated financial covenants. As at January 31, 2002, the company was not in compliance with the cash coverage covenant. The company is currently re-negotiating its credit facilities with the bank as well as looking at alternative sources of financing.”

Now we aggregate these five categories to a single overall financial constraint group. The five mutually exclusive groups are: not financially constrained (NFC), likely not financially constrained (LNFC), potentially financially constrained (PFC), likely financially constrained (LFC), and financially constrained (FC). A firm belongs to NFC group if it has at least one statement coded as a 1 and no statement coded below a 2. These are firms that indicate more than sufficient liquidity and no evidence to the contrary. A firm belongs to LNFC group if its statements are only coded as 2s. These are firms that indicate sufficient liquidity with no statements of excessive liquidity and no statements indicating any weakness. A firm with mixed information about their constraint status belongs to the PFC group. An example is a firm that has a statement coded as 2 or better (indicating financial strength), but also has a statement coded as 3 or worse (indicating possible financial weakness). The firm also belongs to the PFC group if all of its statements are coded as 3. A firm belongs to the LFC group if at least one statement is coded as 4, no statement is coded as 5, and no statement is coded better than 3. These are firms that indicate some current liquidity problems, with no offsetting positive statement and no statement that is so severe that they are placed into the lowest (FC) category. Finally, a firm belongs to the FC group if at least one statement is coded as 5 and no other statement is coded better than 3. These are firms that clearly indicate the presence of constraints with no strong offsetting positive disclosures.