

The impact of performance-based compensation on misreporting

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Abstract

This paper examines the effect of CEO compensation contracts on misreporting. We find that the sensitivity of the CEO's option portfolio to stock price is significantly positively related to the propensity to misreport. We do not find that the sensitivity of other components of CEO compensation, i.e., equity, restricted stock, long-term incentive payouts and salary and bonus have any significant impact on the propensity to misreport. Relative to other components of compensation, stock options are associated with stronger incentives to misreport because convexity in CEO wealth introduced by stock options limits the downside risk on detection of the misreporting.

Keywords: Restatements; Misreporting, compensation, options
JEL Classification Code: G30, G32, G34

1. Introduction

In September 1998, Arthur Levitt, the then chairman of the SEC, remarked that the desire of executives to increase the value of their stock options gave them an incentive to manipulate their accounting numbers. Back in 1997, when large option grants were becoming more prevalent, L. Dennis Kozlowski, former CEO of Tyco, characterized options as a “free ride... a way to earn megabucks in a bull market with a hot company.”¹ Is the earnings management referred to by Levitt motivated by firms trying to look like a “hot company” to earn “megabucks” during a bull market? Does the recent increase in the number of accounting restatements coinciding with the increase in the use of stock options serve as evidence of what these men said?

This paper examines whether and how management’s incentives, through their compensation contracts, affects the likelihood of engaging in unusual accounting practices that result in a restatement of financial statements. If aggressive accounting practices affect stock prices, then managers with equity-linked compensation could have an incentive to maximize their wealth through accounting choices. Given the increased linkage between a manager’s compensation and stock price, it is important to examine the relationship between compensation contracts and accounting choices.

We compare S&P 1500 firms that announce a restatement to their financial statements over the period 1995 to 2002 with those firms that do not restate. Our sample of restating firms includes only firms that restated because the original financial statements were not in accordance with Generally Accepted Accounting Principles (GAAP). We measure the sensitivity of all components of CEO compensation to firm performance and examine the effect of this sensitivity on the incentives to adopt aggressive accounting practices that result in a restatement.

In particular, we are interested in the effect of stock options on the adoption of aggressive accounting practices. Option compensation makes CEO’s wealth a convex function of stock price. Consequently, the CEO benefits from an increase in the stock price associated with aggressive

¹ Wall Street Journal (1997), Executive Pay (A Special Report)- View From the Top: A CEO discusses his unusual pay package with a shareholder activist, by J. Lublin, April 10, 1997.

accounting. However, the loss to CEO wealth in the event of a decline in the stock price is limited. Management is rewarded in good times, but not hurt as much in the bad times. We measure option sensitivity as the change in the value of stock options held for a 1% change in firm value. In our sample of 266 restated firm-years and some 8000 non-restated firm years, we find strong evidence that option sensitivity is positively associated with misreporting. The greater is the sensitivity of CEO wealth to stock price arising from his option holdings, the greater is the propensity to misreport. Further, we find significant evidence that the greater the convexity of CEO wealth to stock price the greater is the propensity to misreport. The evidence is consistent with the hypothesis that incentives from options encourage aggressive accounting practices that results in restatement.

Like stock options, equity and restricted stock also tie CEO's wealth to stock price. Equity and restricted stock might also generate incentives to misreport. However in contrast to options, the payoff from equity and restricted stock has a symmetric relation to stock price. This exposes the CEO to price declines associated with the announcement of a restatement, unless the CEO unwinds his equity and restricted stock holdings prior to the restatement. The vesting requirements associated with restricted stock and the possible loss of control benefits associated with sale of equity might limit the desire and ability of CEOs to unwind their holdings of equity and restricted stock. This suggests that equity and restricted stock expose the CEO to price declines and therefore may not be associated with a higher propensity to misreport. In line with this, we find no evidence that incentives from equity and restricted stock are associated with misreporting. Although equity and restricted stock holdings potentially bear the costs of misreporting, there is no evidence that the costs are large enough to mitigate the positive effect of stock options on misreporting.

Long-term incentives plans make CEO wealth a function of longer-term firm value. This reduces the incentives of CEOs to misreport to boost short-term stock prices. Consistent with this, we find no evidence that long-term incentive payouts are associated with a propensity to misreport. The final component of CEO compensation that we examine is the cash component i.e., salary and bonus. Increased bonus payments associated with higher earnings are also likely to encourage CEO's to misreport.

However, we find no evidence that increase in salary and bonus is a significant motivation for misreporting.

We collect data on the magnitude of the restatement, i.e. the effect of the restatement on net income. We find a positive significant association between option sensitivity and the magnitude of the restatement. Higher incentives from stock options are not only associated with a higher propensity to misreport but also associated with higher magnitudes of misreporting. We continue to find no evidence that incentives from other components of CEO compensation are related to the magnitude of the restatement.

We also examine and control for other firm characteristics that might be associated with misreporting. We find that restating firms are somewhat larger than non-restating firms. Further, restating firm years are associated with higher leverage in comparison to non-restating firms years. There is no significant difference between restating firm years and non-restating firm years in growth opportunities, research intensity, and external finance raised in multivariate analysis.

The firm's environment might effect the propensity to misreport. Bolton, Scheinkman, and Xiong (2003) argue that managers are more likely to use aggressive accounting in speculative periods associated with higher market valuations. We find weak evidence in support of this. Misreporting is more likely in periods where the mean industry market-to-book ratio is high. However, we do not find that investor optimism, as proxied by long term analyst forecasts, is related to the incidence of misreporting.

Bebchuk, Fried, and Walker (2002), argue that options enable management to extract rents in the form of excessive compensation. This rent extraction is achieved when CEOs taking advantage of information asymmetry are able to pool with CEOs exercising for liquidity or diversification needs. A consequence of this camouflage is that the market under-reacts to the negative information in CEO option exercises during periods of alleged misreporting. We find that large option exercises in periods of alleged misreporting are associated with greater market reaction at the time of the announcement.

The positive effect of incentives from stock options on the propensity to misreport has important implications for the design of executive compensation plans. In prior literature, Jensen and Meckling

(1976) and Smith and Stulz (1985) have shown theoretically that a greater link between CEO compensation and firm performance is associated with better incentive alignment and higher firm values. This suggests that some options holdings may have a positive effect on firm value. Increased incentives for misreporting should be associated with the use of stock options beyond this optimal level. In other words, “excessive” option usage should be related to misreporting. We find some evidence that restating firm years are significantly associated with “excessive” option sensitivity.

The rest of the paper is organized as follows: Section 2 reviews related literature, Section 3 develops hypotheses, Section 4 discusses the data and its characteristics, Section 5 describes the measurement of key variables, Section 6 presents the empirical results and finally Section 7 concludes.

2. Literature review

Jensen and Meckling (1976) analyze the conflicts between managers and shareholders and show that to reduce these agency costs, manager’s compensation should be linked to shareholder wealth. Equity linked compensation is a natural way to achieve this. Smith and Stulz (1985) assert that stock options may be used to mitigate the effects of managerial risk aversion. Stock options make manager’s compensation a convex function of firm value and induce management to take on more positive net present value risky projects. Thus, traditionally, options are viewed as an influential means to align manager’s interest with shareholders. Morgan and Poulsen (2001) find empirical evidence to support this positive effect of stock options on firm value. They document that the market reacts positively to the adoption of performance-sensitive compensation plans.

However, of late, the assumption that options are used solely to align the interests of management with shareholders has come under scrutiny. Bebchuk, Fried, and Walker (2002), argue that options enable management to extract rents in the form of excessive compensation. Especially important to the ability of management to extract rents is their ability to camouflage this rent extraction. Bergstresser and Philippon (2002) model this camouflage as the pooling of managers taking advantage of information asymmetry with those that exercise stock options for liquidity reasons. Bebchuk and Bar-Gill (2003)

make a similar point that the ability of management to take advantage of information asymmetry depends on the amount of shares that managers may sell relative to the number of shares that management would be able to sell for liquidity or diversification purposes.

We add to the literature by exploring the potential effect of stock options on the incentives to adopt aggressive accounting practices. The market uses accounting information to infer firm prospects and value. Given the recent increased linkage between manager's compensation and firm value, it is important to examine the relation between compensation and accounting choices, if any. Implicit in the argument that aggressive accounting can be used to affect stock price, is the assumption that manipulative accounting affects the market. The significant average negative return around the announcement of a restatement suggests the market is not able to detect the use of "purposeful" accounting practices that lead to the restatement, ex-ante. This makes restatements an ideal venue to examine the effect of sensitivity of compensation (to stock price) on accounting choices.

There is mixed evidence that executives manage earnings and other performance benchmarks to maximize their performance-based compensation. Healy (1985) documents that executives manage accruals to maximize bonus payments. Dechow, Sloan, and Sweeney (1995) find no evidence that earnings management, proxied by firms subject to Accounting and Auditing Enforcement Releases (AAERs), is associated with insider equity sales to capitalize on higher market valuations. However, Beneish (1999) finds that managers are more likely to exercise their stock appreciation rights and be net sellers of equity in periods with overstated earnings. Beneish's (1999) and Dechow, Sloan, and Sweeney's (1995) samples however focus on periods prior to 1993. As this period predates the rapid rise in the use of stock options, these studies are unable to address the impact of the use of stock options on accounting choices. Further, examining firms that restate due to the use of aggressive accounting choices rather than a much smaller sample of firms that were subject to AAERs increases the relevance and generalizability of results.

In more recent work, Gao and Shrieves (2002) find earnings management intensity to be significantly and positively associated with the sensitivity of the CEO's option portfolio to stock price.

Although Gao and Shrieves (2002) attribute this relation to the manager's attempt to exploit the nonlinearity in the option compensation payoff, they do not test for this empirically. There are some recent papers that empirically examine restatements but do not concentrate on CEO compensation. Richardson, Tuna and Wu (2003) examine the usefulness of accounting information in predicting restatements whereas Agarwal and Chadha (2002) examine the effect of board characteristics on the propensity to restate.

3. Hypotheses

Option holdings tie the CEO's wealth to the firm's stock price. Use of aggressive accounting practices that increase the stock price will positively effect the value of the CEO's option holdings while limiting the losses due to price declines at the detection of the misreporting. The greater is the sensitivity of CEO's wealth to stock price the greater is his incentive to misreport.

H1: CEO's with higher pay for performance incentives from stock options are more likely to adopt aggressive accounting practices associated with restatements.

Stock options usually have vesting requirement of three to five years. Since stock options are granted every year, at any given time CEOs have a portfolio of vested as well as unvested options. As vested options can be exercised during periods of alleged misreporting they are more likely to be associated with aggressive accounting practices.

H2: Aggressive accounting is more likely when pay for performance incentives from vested options is high.

Further, we know that stock options make the CEO's wealth a convex function of the stock price. The pay for performance incentive from stock options is not constant but rather increasing in firm value. When the convexity of CEO wealth is large, there are significant changes in pay for performance incentives of stock options for a unit change in stock price. In this case, an increase in stock price

associated with the use of aggressive accounting practices not only increases CEO wealth but does so at an increasing rate.

H3: Aggressive accounting is more likely to occur when a small change in price causes a large change in pay for performance incentives or when convexity is greater.

Similar to options, other components of CEO compensation like equity, restricted stock and long term incentive payments (LTIP) also tie manager's wealth to firm performance. The asymmetric payoff structure of stock options mitigates the negative effect of a stock price decline on CEO's wealth. In contrast, other components of compensation like stock and restricted stock have a symmetric payoff structure and expose the CEO to stock price declines. Equity and restricted stock bear the cost of misreporting unless the CEO is able to sell before the price decline associated with detection. Unwinding equity and restricted stock may be more difficult than option positions. Large equity stakes are likely to generate control benefits. Restricted stock usually has three to five year vesting requirements and may also have several other restrictions on sale. LTIP payouts lengthen a manager's time horizon by making his wealth a function of longer-term firm value. This effectively increases the manager's time horizon and reduces desire to cash out while market valuations are high (Shliefer and Vishny (2002)).

Consequently, equity, restricted stock and LTIP should not be associated with higher incentives to misreport. Potential losses to large equity, restricted stock and LTIP may also counter the gains to option holdings from misreporting. Higher incidence of these components of compensation may mitigate the positive effect of stock option sensitivity on misreporting. This leads to the following hypothesis

H4: Equity holdings, restricted stock and long term incentive payouts (LTIP) are not associated with aggressive accounting practices. Large holdings of equity, restricted stock and LTIP may mitigate the positive effect of stock options on the incentive to misreport.

The level of bonus payments is usually linked to reported earnings and other accounting based performance measures (Sloan (1993)). Healy (1985) documents that executives manage accruals to

maximize their bonus payments. CEOs of firms, where the sensitivity of salary and bonus to reported firm performance is high, will therefore have greater incentive to misreport.

H5: Higher sensitivity of bonus payouts to firm performance should be associated with a greater incentive to misreport.

Bolton, Scheinkman, and Xiong (2003), Bebchuk and Bar-Gill (2003) and Povel, Singh and Winton (2003) argue that misreporting is more likely in periods characterized by investor optimism. This implies that propensity to misreport is a function of the firm's environment.

H6: Aggressive accounting is more likely to occur in speculative periods, or in periods with higher market valuations.

Prior literature documents that sales and purchases by insiders convey inside information to the markets and are associated with changes in market price (See for e.g. Seyhun (1986)). CEO's exercising options during the period of alleged manipulation are able to camouflage their inside information by pooling with managers who are exercising for liquidity reasons (Bergstresser and Phillippon (2002), Bebchuk and Bar-Gill (2003)).² Because the markets do not fully incorporate the information in inside exercises during the alleged manipulation period, this information is likely to be incorporated at the time of announcement of the restatement. The larger the option exercises in the period of alleged misreporting the more negative will be the market reaction on the announcement of the restatement.

H7: The market reaction to the announcement of a restatement is negatively related to option exercise activity of managers in periods with alleged misreporting.

In the examination of the effect of managerial incentives on the adoption of aggressive accounting practices, we focus on CEO incentives relative to incentives of non-CEO executives. CEO's

² The ability of managers exercising options in alleged manipulation periods to pool with those that are exercising for liquidity reasons depends on how effectively the firms releases other information during the misreported years that are consistent with the misreported financial statements.

compensation is likely to be a central issue because aggressive accounting practices would not be adopted without the explicit or implicit consent of the CEO.³ Further, relative to other executives, CEOs hold more of their compensation in the form of performance-based compensation. Options are of particular interest because they are especially responsible for the increase in the sensitivity of CEO wealth to firm performance (Hall and Liebman (1998)).

4. Data and Methodology

The sample consists of firms with data on ExecuComp database that announce a restatement to their financial statements over the period 1995 to 2001. ExecuComp covers the S&P small-cap (600), mid-cap (400) and large-cap (500) indexes. The sample consists of announced restatements that were due to accounting irregularities resulting in material misstatements of financial reports. Though firms could restate their financial statements due to changes in accounting practices, merger and acquisitions, stock splits and isolated errors, they are included in our sample only if the original financial statements were not in accordance with Generally Accepted Accounting Practices (GAAP).

This list of firms that restate their financial statements due to accounting irregularities was compiled by The General Accounting Office (GAO) for a report to the Chairman, Committee on Banking, Housing and Urban Affairs of the U.S. Senate, titled “Financial Statement Restatements: Trends, Market Impacts, Regulatory Response, and Remaining Challenges.” GAO identified 919 announcements of accounting restatements by 845 firms over the period January 1997 to June 30, 2002. These announcements were identified by the GAO through a Lexis-Nexus search with variations of the word ‘restate’. We add to the GAO list with a Lexis-Nexis search that identifies S&P 1500 firms that announce a restatement between 1995 and 1997, and through the end of 2002.

We match the list of restating firms to those covered in ExecuComp to obtain a sample of 215 restating firms. Conditioning on the availability of firm data in ExecuComp is likely to lead to the inclusion of larger firms than the average restating firm. However, these restatements are more likely to

³ Wall Street Journal, Why Boardroom Bad Guys Have Now Emerged en Masse. by D. Wessel, June 20, 2002.

concern policy makers and investors. Moreover, recent studies indicate that the size of the average restating firm has increased over time (Richardson, Tuna, and Wu, 2003; GAO, 2002). We exclude financial firms (SIC 60-69) due to the difficulty in interpreting variables like leverage and market-to-book that are used as controls.

By including firms that restated due to accounting irregularities, the sample attempts to capture restatements resulting from “purposeful” aggressive accounting choices. The significant market reactions on the announcement of the restatement support the fact that the restatements are due to purposeful accounting practices. Restatements within the confines of GAAP are not associated with significant market reactions (Palmrose, Richardson, and Scholz, 2001). The mean (median) cumulative abnormal returns (CAR) from -5 to + 5 days around announcement are -10% (-5%) (See Table 8). These market reactions are in line with the mean CAR from day -1 to + 1 of -10% reported by the GAO (2002) for their entire sample. Further, we find that 38 of the 215 restating firms were under formal SEC investigation and subject to AAERs. Since the sample includes firms that announced a restatement as late as the end of 2002, this list of firms that were subject to SEC enforcement action is conservative as the SEC could still decide to charge more firms. This provides further support that our sample of restating firms consists of firms with purposeful accounting choices. The inclusion of the magnitude of restatement will also control for those restatements that did not have significant impact.

Summary Statistics

Table 1 presents summary statistics for our sample of restating firms. Panel A reports the distribution of the announcements of the 215 restatements from 1995 through 2002. There is an increase in the number of restatements in our sample over time. This finding is consistent with the general increase in the number of restatements over time reported by Richardson, Tuna, and Wu (2003) and GAO (2002).

For our sample of restating firms, we collect data on the fiscal years and quarters that were misreported and subsequently restated. 266 firm years were restated for our sample of 215 restating firms. The number of restated years is greater than the number of announcements because some firms

restate multiple years. Panel B of Table 1 reports the distribution of these restating firm years. For our sample, fiscal years 1998, 1999 and 2000 are most likely to be misreported and restated.

Panel C reports the distribution of restating firms by the reason of restatement. Restatements due to revenue recognition usually involved reporting revenues sooner or later than allowed under GAAP rules or reporting fictitious revenues (Approximately 40%). Restatements due to improper accounting of goodwill, inventory valuation, and asset write-downs are classified under restructuring, assets and inventory and accounted for 16% of the restatements. Cost or expense related reasons for restatements usually involved improper cost recognition or other cost related improprieties (12% of the sample).⁴

The median sample firm restates one year of financial statements. The time elapsed from the misreported period to the announcement of the restatement is 1.08 years for the median firm (See Panel D of Table 1). We also collect data on the magnitude of the restatement, i.e., the effect of the restatement on net income.⁵ The average effect of the restatement on net income was a reduction of \$101.32 million (See Panel E). The median was however much lower at \$10.5 million. If a firm restated more than one year, the effect on net income is the sum of the effect on earnings over the entire misreported period. Approximately, 93% of the restatements involved overstating net income in the year of misreporting. The mean (median) effect on net income for restating firms that overstated net income was higher at \$117.1 (\$13.8) million. The size of the restatement is a non-trivial percentage of net income. For the average firm, the size of the restatement was 26.37% of the absolute value of restated net income. Restated net income is the sum of the net income originally reported and the effect of the restatement on net income. The median value is lower at 13.62% of restated net income.

⁴ Other reasons were acquisition and merger related restatements (involved the use of a wrong method to account for the merger/ acquisition or misreporting the related gains/ losses), and In-process research and development related restatements (involved the use of wrong methodologies to value in process research and development at the time of acquisition). Restatements due to reclassifications, related party transactions, improper accounting of derivatives were classified in the category other.

⁵ The data was collected from the restatement announcement when available. For firms that do not announce the impact of the restatement on income, the data was obtained from the amended 10-ks filed with the SEC. Data on the size of the restatement could not be obtained for some firms. This was due to several reasons. Firstly, some firms did not report the impact of the restatement on income. Some firms included events (like restructuring charges, one-time charges) other than restatement in the amended earnings. This made it difficult to isolate the impact of the restatement on income. Some firms did not file an amended 10-k. We have also excluded outlier observations where the size of the restatement was more than 200% of restated net income.

Panel F displays the distribution of restating firms by two-digit industry. There is a higher incidence of restating firms in two-digit SIC code 35 (computer equipment), 36 (electrical equipment), 38 (measuring instruments photo) and 73 (business services).

Characteristics of restating firms

In this section, we examine the characteristics of restating firms. Prior literature has suggested several characteristics of firms that may be associated with aggressive accounting practices. As we are interested in the misreported years, we measure firm's characteristics relative to the violation period. Data for restating firms is as initially reported for the fiscal year, that is, we do not use the revised accounting numbers.

Firms with a higher need to access external capital markets are more likely to misreport in order to reduce the cost of external financing (See Dechow, Sloan, and Sweeney (1995), Beneish (1999), Richardson, Tuna, and Wu (2003)). We proxy for equity finance raised as the ratio of additional cash raised from issuance of common and preferred stock in the misreported year to total assets. The value of total assets is the average value over the misreported year and the year prior. Similarly, the proxy for long-term debt raised is the ratio of cash raised from issuance of long-term debt in the misreported years to total assets. The mean value of equity finance raised by restating firms is 0.043 and is significantly higher than the mean of 0.036 for non-restating firms (See Table 2). The mean value of long-term debt finance raised by restating firms is 0.111 which is also higher than 0.097 for non-restating firms. The median equity and long-term debt raised for restating firms are also higher than that for non-restating firms. There appears to be some evidence that restating firms raise more external finance in misreported years that are associated with higher market valuations.

Firms that are close to violating debt covenants are more likely to engage in aggressive accounting practices to avoid the penalties associated with the violations. We follow Richardson, Tuna and Wu (2003) by examining leverage as a proxy for closeness to debt covenant violations or costs of financial distress. Leverage is the ratio of short-term and long-term debt in the misreported year to total

assets. The mean (median) value of leverage for restating firms is 0.256 (0.258) and is significantly higher than the mean (median) value of 0.225 (0.223) for non-restating firms. There is some evidence that firms might adopt aggressive accounting practices to reduce the costs of financial distress.

Restating firms are likely to differ from non-restating firms in their growth opportunities. Povel, Singh, and Winton (2003) show that high growth firms facing reduced growth opportunities are most likely to adopt aggressive accounting practices. We use two proxies for growth opportunities: 1) earnings-to-price ratio and 2) market-to-book. There is no statistical difference in the market-to-book value of restating and non-restating firm years. However, average earnings-to-price ratio for restating firm years (0.067) is lower than that for non-restating firm years (0.087).

We use market capitalization of the firm in the misreported year to proxy for firm size. The median market value for restating firm years is \$2007 million and is significantly higher than the \$1047 million for non-restating firm years. The means are however not significantly different from each other. The restating firms in our sample are larger than those of Richardson, Tuna, and Wu (2003). This difference likely reflects the fact that we condition the sample on ExecuComp coverage.

Dechow, Sloan and Sweeney (1996) and Richardson, Tuna, and Wu (2003) find that misreported firm years had higher accruals. We examine the use of discretionary accruals in restating firm years versus non-restating firm years. We estimate discretionary current accruals using Teoh, Welch, and Wong (1998) methodology. Discretionary current accruals are the difference between current accruals and non-discretionary or expected current accruals. To determine expected current accruals we regress current accruals on a constant and change in sales, with all variables normalized by total assets. This is a cross-sectional regression at the two-digit SIC level. Expected or non-discretionary accruals are the fitted value of current accruals while discretionary current accruals are the residuals from the above regression (See Appendix A for further details).

We find no difference in the discretionary accruals of restating firm years and those of non-restating firm years. This is in contrast to higher accruals for restating firms documented by Richardson, Tuna and Wu (2003). The difference in results could be due to the difference in the construction of the

sample. Richardson et al (2003) have firms that restate over the period 1971 to 2000, though most of the restatements are in the nineties. Their non-restating sample consists of all firms with data on Compustat over the period 1971 to 2000. Since restatements are not evenly spread out over time, this leads to a higher proportion of non-restating firms in the early part of the sample. Part of the difference between restating and non-restating firms documented by Richardson et al. (2003) may be due to time trends in the data.

CEOs that are close to retirement with shorter horizons are likely to have higher incentives to adopt aggressive accounting practices for short-term gain. We use CEO tenure to proxy for how close the CEO is to retirement. The mean value of CEO tenure for restating firm years is 6.8 years and is not significantly different from 6.92 years for non-restating firm years.

5. Measures of Sensitivity of CEO compensation

In this section, we discuss the measures of pay for performance incentives of the various components of CEO compensation.

Option sensitivity

We measure the pay for performance sensitivity of stock options, to be referred to as option sensitivity, as the change in the value of stock options held for a percentage change in firm value. This measure, used by Core and Guay (2002), is obtained by multiplying the option delta with 1% of the stock price and the number of options held. Delta for options outstanding is the partial derivative of the option value with respect to stock price.⁶

Our measure of option sensitivity is different from that used by Jensen and Murphy (1990). Jensen and Murphy (1990) define option sensitivity as the change in the value of options held for a dollar change in firm value. Their measure is obtained by multiplying the option delta with the ratio of options

⁶ Consistent with prior literature, (See Yermack (1995), Jensen and Murphy (1990)), we use the Black-Scholes model (Black and Scholes (1973), adjusted for dividend payouts (Merton (1973)) to value the options. The inputs to the Black-Scholes value like stock price, exercise price, volatility, time to maturity and dividend yield were obtained from ExecuComp. The risk free rate is from the Federal Reserve Bank at St. Louis.

outstanding to shares outstanding. Baker and Hall (1998) argue that the right measure of option sensitivity depends on the kind of activity under consideration. For activities where the dollar impact does not depend on firm size, Jensen and Murphy (1990) is the right measure. For activities that affect the whole firm, Core and Guay's (2002) measure is appropriate. Since aggressive accounting practices affect the whole firm, Core and Guay's measure is appropriate for this case. Hence we report all our results with this measure. However, to examine the robustness of our results we also estimate our model with Jensen and Murphy's measure. We find that our results are qualitatively unchanged.

Sensitivity of restricted stock and equity holdings

Consistent with the measure of option sensitivity, sensitivity of restricted stock and equity holdings is defined as the change in the value of these holdings for a 1% change in firm value. For the purpose of this calculation we assume that the delta of both restricted stock and equity is one, i.e., there is one to one change in their value for a change in stock price. The sensitivity of restricted stock (equity) is obtained by multiplying the number of shares of restricted stock (equity) held with 1% of the stock price.

Long-term incentive plans

We measure the effect of long-term incentive plans (LTIP) as the payout from long-term incentive plans divided by total compensation including option grants. We are constrained in using the payouts on LTIPs as ExecuComp does not provide information on the details of the payout and only reports its value. LTIPs are usually based on a three to five year moving average of firm performance.

Sensitivity of Salary and Bonus Payments

We estimate the sensitivity of salary and bonus to earnings for firm i in year t at the two-digit industry level.⁷ A cross-sectional regression of changes in salary and bonus on changes in net income is estimated at time t for all firms in the same two-digit SIC as firm i (See Sloan (1993) for further details).

⁷ We thank an anonymous referee for suggesting this.

The estimated coefficient of change in net income in the above regression is the proxy for the salary and bonus sensitivity at time t for firm i .

Convexity of Stock Options

A feature that sets options apart from other forms of equity compensation is the convexity of the options. Convexity is measured as the second derivative of option value to stock price. This measure of convexity, gamma, captures the rate of change of option sensitivity (delta) to stock price.⁸ Aggressive actions may be more likely when the value of an option is more convex in stock price. Jensen (2001) explains that when targets are set for compensation, management has the incentive to meet that hurdle, even at the expense of the company over the long-term. As with the measurement of the option sensitivities, we estimate gamma for the vested, unvested, and new grants of options and sum them up to obtain the gamma for the option portfolio. Gamma is largest when options are at the money.

6. Empirical Results

We begin by reporting some summary statistics of the sensitivity of components of CEO compensation for restating and non-restating firm years (Table 3). The mean (median) value of option sensitivity for misreported firm years is \$567,802 (\$132,367). On average, the value of the stock options held by the CEO changes by \$567,802 for a 1% change in stock price. This is significantly higher, at the 1% level, than the mean (median) value of \$263,595 (\$79,998) for non-restating firm years. There appears to be significant evidence, in univariate tests, that CEOs have larger incentives from stock options in misreported years.

The mean incentive from equity holdings for restating firm years is \$745,352. Though this is higher than the mean incentives of \$586,526 for non-restating firm years, the difference is not statistically significant. The median incentive from equity for restating firm years is \$62,274 and much lower than

⁸ Gamma is the second derivative of the option value with respect to price and is based on the Black Scholes model

of option valuation. In particular it is given by $\Gamma = \frac{\partial^2 V}{\partial P^2} = \frac{e^{-dT} f(Z)}{PS\sqrt{T}}$.

the mean value. The mean (median) value of sensitivity from restricted stocks for restating firm years is \$23,012 (0). This is not significantly different from the mean (median) value of \$26,872 (0) for non-restating firm years. Similarly, we find no difference between restating and non-restating firm years in LTIP payouts. Salary and bonus sensitivity for restating firm years is 0.357 and is actually lower than the estimated sensitivity of salary and bonus for non-restating firm years. However, there is no difference in the median sensitivity of salary and bonus.⁹

Finally, we examine whether CEO's have higher exercises in misreported years to capitalize on the higher market capitalization in these years. To capture CEO exercise activity we examine the ratio of CEO option exercises to exercisable outstanding options. CEOs exercise 38.75% of their outstanding exercisable options in restated firm years. This is significantly higher than 22.6% by CEOs of non-restating firm years. However, there is no difference in exercises at the median. Total compensation is also significantly higher for restating firm years in comparison to non-restating firm years.

Table 4 reports the results of a logit regression estimating the effect of the sensitivity of components of CEO compensation on incidence of misreporting. We use the log of option sensitivity as in Core and Guay (1999), because this measure increases at a decreasing rate with firm size. Column 1 shows that the coefficient of option sensitivity is positive and significant at the 1% level. The results support hypothesis 1 that restated years are associated with higher incentives from stock options.

As discussed in hypothesis 4, equity and restricted stock holdings are more likely to expose the CEO to price declines at the announcement of the restatement and should be associated with no incentives to misreport. In support of this hypothesis we do not find any evidence that incentives from equity and restricted stock are associated with greater incentives to misreport. We also do not find any evidence the LTIP is associated with greater incentives to misreport.

Hypothesis 5 states that salary and bonus incentives should be associated with higher incentives to misreport. However, we do not find that salary and bonus significantly effect the adoption of

⁹ The restating and non-restating firm years appear to be different at the 25th percentile though not at the 75th percentile. This suggests that some restating firm years have low values of bonus sensitivity explaining the lower mean value for the restating firm years.

aggressive accounting practices. This result is in contrast to the finding of Healy (1985) that executives manage accruals to maximize bonus payments. The difference in results might be due to the use of restatements to proxy for earnings management versus the use of discretionary accruals within the confines of GAAP. It might also be due to the declining share of salary and bonus in overall CEO incentives over this time period.¹⁰

In column 2, we control for industry and time trends that might explain the above results. We include an industry dummy that takes the value one if the firm belongs to two-digit SIC industries 35, 36, 38 and 73. As can be seen in Table 1, Panel F these industries are highly represented in the restating sample. This industry dummy controls for industry characteristics that may be correlated with the incidence of aggressive accounting practices. We also include dummies for years 1995 through 2001. Further, we include lagged market value of equity to control for firm size, lagged market-to-book to control for growth opportunities and lagged firm leverage. The coefficient of industry dummy is positive and significant suggesting that industry characteristics explain the propensity to misreport. Consistent with the univariate evidence, we find that larger firms are more likely to restate (the coefficient of market value of equity is positive and significant). We also find that highly levered firms, with larger expected costs of financial distress, are more likely to restate. However, there is no evidence that growth opportunities as proxied by market-to-book explain misreporting. After controlling for the above factors there still is a significant positive effect of option sensitivity on misreporting. There is no significant effect of other components on the propensity to misreport. The effect of option sensitivity on the probability of misreporting is not only statistically significant but also economically significant. At the mean, a 3.52% increase in option sensitivity increases the probability of restating by 0.35%.

Next, we test for whether large holding of equity, restricted stock and LTIP influence the effect of option sensitivity on misreporting. As stated in hypothesis 4, large equity, restricted stock and LTIP payouts may mitigate the positive effect of option sensitivity on misreporting. To capture large equity

¹⁰ The share of cash compensation in overall compensation declined from 69.4% in 1992 to 48.3% in 2001 for all firms with data in ExecuComp.

holdings we create a dummy that takes the value one when the percentage of the firm owned by the CEO is above the median value for the sample. If large equity holding mitigate the effect of option sensitivity then the coefficient of the interaction of the large equity holding dummy with option sensitivity will be negative and significant. We find that the coefficient is negative but not statistically significant (Table 4, model 5). Similarly, we create a dummy for large holding of restricted stock. This dummy takes the value one if the CEO percentage ownership in restricted stock is above the median value for the sample. The median value is calculated by including all firm years with non-zero restricted stock holding. The coefficient of the interaction of the high restricted stock dummy and option sensitivity is negative as expected but again not significant. Finally, we create a large LTIP dummy that takes the value one if the LTIP is higher than the median value for the sample. The coefficient of the interaction of the large LTIP dummy and option sensitivity is again not significant. Though equity, restricted stock and LTIP do not generate any incentives for misreporting there is little evidence to suggest that they mitigate the positive effect of option sensitivity on misreporting.

Lastly, we examine whether vested options are associated with greater incentives for misreporting as discussed in hypothesis 2. If managers who are misreporting are focusing on the short-term, then vested options should be relatively more important in influencing the adoption of aggressive accounting practices. The coefficient of vested option sensitivity is positive and significant. The coefficient of unvested options is positive though it is significant only at the 14% level. As expected, we find that vested options are associated with higher incentives for misreporting than unvested options.

Further Tests and Robustness Checks

We test for the robustness of our results by inclusion of other variables, as well as the use of different empirical proxies (Table 5). First, we examine the need for raising external finance at lower costs as a motivation for adopting aggressive accounting practices. We include in our estimation total external finance raised by the firm. This is the ratio of cash raised from the issuance of common stock,

preferred stock and long-term debt to total assets. We do not find any evidence that higher external finance is a motivation for earnings management in a multivariate framework (Table 5, Model 1).

As discussed earlier, restating firms have higher representation in two-digit SIC codes 35, 36, 38 and 73. An industry dummy for these SICs, is significant in explaining misreporting. We explore industry characteristics, common to these two-digit SICs, that might explain the higher representation of restating firms. In particular, we examine whether greater information asymmetry in these industries might explain misreporting. As it is harder to verify that a service or other intangible asset has been provided than it is to verify a tangible asset, we include the ratio of the sum of research and development expenses and advertising expenses to total assets. We find no evidence that research intensity explains the higher representation of restating firms in these industries (Table 5, Model 2).

Hypothesis 6 states that misreporting is more likely to occur in speculative periods or periods with higher market valuations. We use two proxies for the firm's environment. First, we include the average market-to-book ratio for the firm's industry in the year. The firm's industry consists of all S&P 1500 firms in the same two-digit SIC. Second, we include analyst forecasts of long-term industry growth rates. The long-term industry growth forecast is the average value of long-term growth forecasts for all firms in the two-digit SIC industry for that year in I/B/E/S. The coefficient for average industry market-to-book ratio is positive and significant at the 8% level. However, the coefficient of the average long-term growth forecast is not significant (Table 5, Model 3 and 4). There appears to be weak evidence in support of hypothesis 6, that misreporting is higher in years associated with higher market valuations.

To examine the effect of CEO's time horizon, we include CEO tenure. There is no evidence that CEOs with longer tenures, and close to retirement, are more likely to misreport. There is also no evidence that for CEOs closer to retirement, option sensitivity has a greater effect on misreporting. The coefficient of the interaction of CEO tenure with option sensitivity is not significant (Model 6).

Jensen and Murphy (1990) documented that the pay for performance incentives of managers appear to be low. Some of the increased use of stock options in the past decade was intended to increase firm value through better incentive alignment of the manager with those of shareholders. This suggests

that the some of the option incentives should be associated with a positive effect on firm value. Increased incentives for misreporting should be associated with the use of stock options beyond this optimal level. In other words, “excessive” option usage should be positively related to the misreporting.

We examine this issue by estimating CEO option sensitivity that is beyond the desired level, i.e., abnormal option sensitivity. Abnormal option sensitivity is the deviation of option sensitivity from optimal option incentives. Optimal option incentives are estimated using the methodology of Core and Guay’s (1999). For this, we regress CEO option sensitivity on market value of equity, idiosyncratic risk, book-to-market, CEO tenure, Free Cash flow problem and industry dummies (See Appendix B for further details). Abnormal option sensitivity is the residual from this cross-sectional regression. The abnormal incentives from equity are similarly defined. A positive (negative) residual indicates that incentives are above (below) their optimal level. The model explains a large portion of the cross-sectional variation in option sensitivity, with an adjusted R-square of 57%. It explains the variation in equity incentives to a lesser extent, with an adjusted R-square of 40%. Results of the model’s estimation are available from the authors upon request.

The coefficient of abnormal option sensitivity is positive and significant at the 1% (Table 5, Model 7). Abnormal equity incentives do not generate any incentives for misreporting. The results for other components of compensation are unchanged. Though industry and year effects have been controlled for in the estimation of abnormal option sensitivity, we include industry and year dummies as a robustness check. We find that though the coefficient of abnormal option sensitivity is positive it is significant only at the 11% level. These results suggest that *CEOs* have incentives from options that deviate from optimal incentive levels in the year of misreporting.

Magnitude of Earnings Restated

Though our sample of restating firm consists of firms that made “purposeful” accounting choices, there is likely to be substantial variation in how aggressive the choices were. In other words, the impact of the misreporting on earnings could vary across the restating group. Egregious misreporting that is

associated with substantially restated earnings is more likely to be associated with CEOs whose wealth is highly sensitive to stock prices i.e., those with large option sensitivity. We examine whether option sensitivity is related not only to the propensity to misreport but also to the magnitude of the misreporting.

We use the effect of the restatement on net income to capture the size of the restatement. For firms that restate multiple years, this is the average annual effect.¹¹ This change in net income due to the restatement is scaled by the restated value of net income. The restated value of net income is the sum of the originally reported net income and the change in net income due to the restatement. For firms that do not misreport, the size of the restatement is zero. This creates censoring in the data and consequently we estimate a Tobit model (See Table 6).

The coefficient of option sensitivity continues to positive and significant. Larger restatements are associated with higher values of CEO option sensitivity. The other results are also unchanged. There is no effect of incentives from equity, restricted stock and LTIP on the magnitude of misreporting. Similarly, incentives from salary and bonus do not appear to be related to the magnitude of the restatement.

Convexity of Stock Options

In this section, we examine the effect of the convexity of stock options on the incentives to adopt aggressive accounting practices as discussed in hypothesis 3. We use gamma, the second derivative of option value to stock price to capture the convexity in CEO wealth introduced by stock options. The coefficient of gamma is positive and significant (Table 7). CEOs holding options with greater convexity are more likely to misreport. To further explore the effects of components of the option portfolio, we include the delta and gamma of the vested and unvested components of the portfolio (Delta and gamma are significantly correlated with a Pearson's coefficient of 0.11 which is significant at the 1% level).

We find consistent with results of table 4, that only the coefficient of the sensitivity of vested options is positive significant. Interestingly, though misreporting is positively related to the convexity of

¹¹ For firms with multiple years we estimate the sum of the effect on earnings for the years that were misreported. The average annual effect is obtained by dividing the above cumulative effect by the number of misreported years.

both vested and unvested options, only the coefficient of convexity of unvested options is significant. The unvested portion of the CEO's option portfolio has a positive significant effect on the propensity to misreport when it has higher gamma, i.e., when a small change in price results in a large change in incentives.

Announcement Period Return

The market reaction to the announcement of a restatement is likely to be negatively related to option exercises by the CEO during the alleged manipulation period (Hypothesis 7). To test for this we calculate cumulative abnormal returns (CARs) around the announcement of the restatement. For each announcement date abnormal returns around the announcement date are estimated using market model regressions with the estimation period from 397 to 127 days prior to the event date.¹² The average (median) CAR over the -120 to +120 day period is -24.9% (-6%) (Table 8, panel A). CARs over smaller windows around the announcement date are all negative and significant at the 1% level. The mean (median) CAR from -5 to +5 days around announcement are -10% (-5%). These market reactions are in line with the mean CAR from day -1 to +1 of -10% reported by the GAO (2002) for their entire sample. We use the ratio of the value of options exercised by the CEO to the market value of the firm during the misreported period to proxy for intensity of option exercises.

Panel C of Table 8 presents the results of the weighted least squares regression of the CARs over the 11-day window (from five days prior to five days subsequent to the announcement) on CEO exercise activity. We control for firm size, leverage and market-to-book, over the restated year as these variables might affect the magnitude of the market reaction. There is a significant positive effect of CEO exercise activity in the misreported period on announcement day returns. In the second regression, we control for the effect of the size of the restatement on firm performance. The bigger the size of the restatement the greater should be the market reaction. Surprisingly, we do not find that the size of the restatement is significantly related to the market reaction. This might be due to the fact that only some firms disclose the

¹² For the market model regression, the market return was the return on the dividend included value weighted market portfolio of all NYSE/AMEX/Nasdaq stocks. Firm return was the dividend included return on firm i for day t .

size of the restatement at the time of announcement. However, the results with respect of CEO exercise continue to be significant.

7. Conclusion

In this paper, we examine and find significant evidence that CEO compensation packages effect the adoption of aggressive accounting practices that result in a restatement. In particular, CEOs with option portfolios that are more sensitive to stock price are significantly more likely to misreport. We do not find that the sensitivity of other components of CEO compensation, i.e., equity, restricted stock, long-term incentive payouts and salary and bonus have any significant impact on the propensity to misreport. The incentives to misreport are stronger with stock options relative to other components because 1) convexity in CEO wealth introduced by stock options limits the downside risk on the discovery of misreporting and 2) stock options allow CEOs to pool with other executives exercising for liquidity and diversification motives, i.e., options facilitate easy exit strategies for CEOs.

This paper contributes by documenting the importance of managerial self-interest as a motivation for aggressive accounting practices. The results in this paper suggest that misreporting appears to be related to “excessive” option incentives. This has implications for the relative weights of stock options and equity in future CEO compensation contracts. Concerns about mitigating incentives to misreport may lead to greater use of equity and restricted stock instead of options. This shift away from stock options can already be seen with firms like General Electric and Microsoft announcing that they will no longer use stock options to compensate their CEOs.¹³

There is little research into the implications and costs of restatements for managers. A recent study by Desai, Hogan, and Wilkins (2003) documents significant costs borne by managers of restating firms in the labor market. Further examination of the costs borne by managers, through changes in compensation contracts, loss of opportunity in the labor market or high costs of lawsuits, is necessary to understand the effect of accounting choices on the trade-off between managerial costs and benefits.

¹³ The Financial Times, September 19, 2003, “The Largest Groups rein in Excessive deals,” by Adrian Michaels.

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Appendix A: Estimation of discretionary current accruals

The estimation is based on the methodology of Teoh, Welch and Wong (1998). Current assets are defined as

$$CA = \Delta [\text{Accounts Receivable (2) + inventory (3) + other current assets (68)}] - \Delta [\text{accounts payable (70) + tax payable (71) + other current liabilities (72)}].$$

We estimate the following cross-sectional regression, by two-digit SIC and year, on all firms in Compustat.

$$\frac{CA_{j,t}}{TA_{j,t-1}} = a_0 \left(\frac{1}{TA_{j,t-1}} \right) + a_1 \left(\frac{\Delta SALES_{j,t}}{TA_{j,t-1}} \right) + e_{j,t},$$

where TA is total assets. Non-discretionary or expected current accruals ($NDCA_{i,t}$) are the fitted values from the above regression and calculated as:

$$NDCA_{i,t} = \hat{a}_0 \left(\frac{1}{TA_{i,t-1}} \right) + \hat{a}_1 \left(\frac{\Delta SALES_{i,t} - \Delta TR_{i,t}}{TA_{i,t-1}} \right) + e_{i,t}.$$

where TR is trade receivables. Teoh (1998) et. al., indicate that change in trade receivables should be subtracted from sales to adjust for potential credit manipulation by a firm. Restating firms are not included in the estimation of parameters. Finally, discretionary current accruals (DCA) is calculated as the difference between current accruals divided by total assets and the estimated NDCA.

Appendix B. Estimation of Abnormal option and equity incentives

We use the methodology of Core and Guay's (1999) to estimate deviations of option and equity incentives from optimal levels. Optimal incentives are the fitted values from the following cross-sectional regression

$$\begin{aligned} \log(\text{incentives}) = & \mathbf{b}_0 + \mathbf{b}_1 \log(\text{market value of equity})_{it} + \mathbf{b}_2 \log(\text{idiosyncratic risk})_{it} \\ & + \mathbf{b}_3 \text{book-to-market}_{it} + \mathbf{b}_4 \log(\text{CEO tenure})_{it} + \mathbf{b}_5 \text{Free-cash-flow problem}_{it} \\ & + \mathbf{b}_6 \text{Industry controls}_{it} + e_{it}. \end{aligned}$$

Equity and option incentives are the change in the value of these holdings for a 1% change in stock price.

Idiosyncratic risk is the standard deviation of the residual from the market model regression, estimated over a

36 month period. Free-cash-flow problem is the three year average of (operating cash flow – common and preferred dividends)/total assets if the firm has low growth options and zero, otherwise. Industry dummies are dummies for two-digit SIC code.¹⁴ The residuals from the above cross-sectional regression is a measure of the deviation of incentives from optimal levels i.e., measure abnormal incentives.

¹⁴ Core and Guay (1999) use 19 industry dummies. However, they do not report the industries used so we used two-digit SIC codes.

Table 1
Descriptive Statistics for Restating Firms

Restating firms are firms that announce restating their financial statements over the period 1995 to 2002 due to accounting irregularities.

Panel A: Distribution of restating firms by announcement year

Announcement Year	Number of announcements
1995	1
1996	4
1997	12
1998	16
1999	37
2000	33
2001	57
2002	55
Total	215

Panel B: Distribution of fiscal years that were restated

Fiscal Year Restated	Number of restatements
1994	3
1995	8
1996	17
1997	24
1998	51
1999	57
2000	64
2001	42
Total	266

Panel C: Reasons for Restatement

Restatements due to revenue recognition usually involved reporting revenues sooner or later than allowed under GAAP rules or reporting fictitious revenues. Restatements due to improper accounting of goodwill, inventory valuation and asset write-downs are classified under restructuring, assets and inventory. Cost or expense related reasons for restatements usually involved improper cost recognition or other cost related improprieties. Acquisition and merger related restatements involved use of a wrong method to account for the merger/ acquisition or misreporting the related gains/ losses. In-process research and development related restatements involved the use of wrong methodologies to value in process research and development at the time of acquisition. All other restatements are under the category other

Reasons for Restatement	Number
Revenue Recognition	84
Restructuring, assets or inventory	33
Cost or Expense Related	26
Merger & Acquisition	13
In-Process R&D	11
Other	44

Panel D: Characteristics of Restatements

Time lapsed is the number of years between the first misreported year and the announcement year

	Number of years restated	Time lapsed
Q1	1.00	0.59
Mean	1.47	1.47
Median	1.00	1.08
Q3	2.00	2.40
N	215	215

Panel E: Size of Restatements

Size of restatement is the sum of the effect of the restatement on net income, in millions of dollars. The second column displays the average annual size of the restatement as a percentage of absolute value of restated net income. Columns 4 and 5 report statistics for the subsample of firms that overstated their earnings.

	Size of Restatement	Size/ Net Income (%)	Size of Restatement (Overstated Earning)	Size/ Net Income (%) (Overstated Earning)
Q1	2.7	3.75	4.3	4.25
Mean	101.32	26.37	117.1	27.88
Median	10.50	13.62	13.8	15.57
Q3	43.00	38.63	47	38.84
N	135	135	125	125

Panel F: Distribution of Restating Firms across Industries

	Two-digit industry	Number		Two-digit industry	Number
Metal mining	10	4	Air Transportation	45	3
Oil and gas extraction	13	6	Transportation Services	47	2
Heavy construction	16	3	Electric and gas	48	4
Food products	20	7	Electric power	49	10
Textile mill products	22	1	Durable goods	50	6
Apparel	23	3	Non-durable goods	51	7
Paper products	26	3	General merchandise	53	6
Printing	27	1	Good stores	54	2
Chemicals	28	9	Accessory stores	56	7
Refining	29	2	Home furniture	57	3
Rubber & plastics	30	2	Eating and drinking places	58	1
Primary metals	33	3	Retail stores	59	3
Fabric metal	34	3	Personal services	72	1
Computer equipment	35	23	Business services	73	38
Electrical equipment	36	16	Motion pictures	78	2
Automotives	37	6	Recreation	79	2
Meas. inst. Photo	38	13	Health services	80	6
Transit & Passenger Trans	41	1	Educational services	87	3
Motor freight	42	1	Other	99	3

TABLE 2

Characteristics of Restating and Non-Restating Firm Years

Market-to-book is the ratio of total assets minus the book value of equity plus the market value of equity to total assets. Leverage is ratio of short-term & long-term debt to total assets. Equity finance raised is additional cash raised from issuance of common and preferred stock normalized by average total assets. Average total assets is the average value of total assets over the misreported year and the year prior. Long-term debt raised is cash raised from issuance of long-term debt divided by average total assets. Market value is the number of shares outstanding multiplied by the price at fiscal year-end and is expressed in millions of dollars. Earnings price is net income from continuing operations divided by the market value. Discretionary current accruals are the deviation of current accruals from non-discretionary or expected accruals (See Appendix A). CEO Tenure is the number of years served as CEO of the firm. Significance levels are computed for the difference in mean (medians) using a t-test and Wilcoxon two-sided t-test. *,**,*** denote significance at the 10%, 5% and 1% level.

	Market to Book	Leverage	Equity Finance Raised	Long Term Debt Raised	Market Value	Earnings Price	Discretionary Accruals	CEO Tenure
<u>Mean</u>								
Mean for Restating Firm Years	2.323	0.256	0.043	0.111	11115.71	0.067	0.004	6.8
Mean for Non-restating Firm Years	2.270	0.225	0.036	0.097	5638.47	0.087	-0.0017	6.92
p-value (mean)	(0.712)	(.003)***	(0.000)***	(0.281)	(0.345)	(.090)*	(0.313)	(0.8)
<u>Median</u>								
Mean for Restating Firm Years	1.651	0.258	0.009	0.049	2007.28	0.071	-0.0015	4
Mean for Non-restating Firm Years	1.634	0.223	0.007	0.035	1041.44	0.088	-0.0023	5
p-value (median)	(0.619)	(0.00)***	(0.056)*	(0.034)	(0.00)***	(0.00)***	(0.761)	(0.23)
N for Restating Firm Years	253	252	244	239	266	253	252	229
N for Non-restating Firm Years	8255	8247	7877	7777	8805	8255	8760	7321

TABLE 3

Summary Statistics for Sensitivity of CEO Compensation

The table presents the characteristics of CEO compensation for restating and non-restating firm years. Option sensitivity is the dollar change in the value of stock options held by the CEO for a 1% change in stock price and is reported in thousands of dollars. Equity and restricted stock sensitivity is the dollar change in the value of the equity and restricted stock held by the CEO for a 1% change in stock price. It is also reported in thousands of dollars. LTIP is the long-term incentive payout. Salary and bonus sensitivity is a measure of the change in salary and bonus payments for a thousand dollar change in earnings. Stock option exercise is the ratio of options exercised by the CEO to outstanding exercisable options. Total compensation is the sum of salary, bonus, equity, and option compensation. Significance levels are computed for the difference in mean (medians) using a t-test and Wilcoxon two-sided t-test. ***, **, * represent significance at the .01, .05 and .10 significance levels, respectively.

	Option Sensitivity (000's)	Equity Sensitivity (000's)	Restricted Stock Sensitivity (000s)	LTIP/Total Compensation	Salary and Bonus Sensitivity	Stock Option Exercises (%)	Total Compensation
Mean							
Restating Firm Years	567.802	745.352	23.012	0.030	0.357	38.75	9394.20
Non-restating Firm years	263.595	586.526	26.872	0.025	0.442	22.66	4342.36
P-value	(0.0)***	(.710)	(.942)	(0.388)	(0.019)**	(0.03)**	(0.00)***
Median							
Restating Firm Years	132.367	62.274	0	0	0.238	0	3315.47
Non-restating Firm years	79.998	43.168	0	0	0.231	0	1913.73
P-value	(0.0)***	(0.047)**	(0.000)***	(0.288)	(0.17)	(0.49)	(0.00)***
Q1							
Restating Firm Years	50.076	12.067	0	0	0.222	0	1004.55
Non-restating Firm years	29.123	9.97	0	0	0.318	0	1730.62
Q3							
Restating Firm Years	535.659	258.671	12.773	0	0.617	12.1	4007.92
Non-restating Firm years	213.902	168.345	1.653	0	0.612	17.7	8428.54

TABLE 4

Logit Regressions for Model of Misreporting

The dependent variable is one if the fiscal year was restated and zero otherwise. Option sensitivity is the change in option value for a 1% change in stock price. Sensitivity of vested (unvested) options is similarly defined. The sensitivity of equity and restricted stock is the change in the value of these instruments for 1% change in stock price. LTIP payouts have been normalized by total compensation. Salary-Bonus sensitivity is the change in cash compensation for a change in earnings. Market-to-book is total assets – book value of equity + market value of equity/total assets. Leverage is short-term debt + long term debt/ total assets. The industry dummy is set to one if the firm is in two-digit SIC industries 35, 36, 38 and 73. The predicted signs are in parenthesis. The regressions comprise 243 restated firm years. ***, **, * represent significance at the .01, .05 and .10 significance levels, respectively

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Option sensitivity (+)	0.291 (0.000)***	0.177 (0.000)***	0.177 (0.000)***	0.178 (0.000)***	0.178 (0.000)***	
Sensitivity of vested options (+)						0.115 (0.002)***
Sensitivity of unvested options (+)						0.074 (0.137)
Sensitivity of Restricted stock (not significant or -)	-0.000 (0.137)	-0.000 (0.127)	-0.000 (0.127)	-0.000 (0.214)	-0.000 (0.124)	-0.000 (0.125)
Long term incentive payouts (LTIP) (not significant or -)	0.517 (0.484)	0.823 (0.280)	0.820 (0.556)	0.835 (0.273)	0.806 (0.293)	0.785 (0.308)
Sensitivity of Equity (not significant or -)	-0.000 (0.255)	-0.000 (0.238)	-0.000 (0.238)	-0.000 (0.235)	-0.000 (0.267)	-0.000 (0.237)
Salary-bonus Sensitivity (+)	-0.599 (0.292)	-0.223 (0.694)	-0.223 (0.694)	-0.223 (0.695)	-0.217 (0.702)	-0.249 (0.662)
High equity ownership dummy* Option incentives (-)					-0.011 (0.764)	
High restricted stock holding dummy* Option incentives (-)				-0.017 (0.817)		
Large LTIP dummy* Option incentives (-)			0.000 (0.997)			
Market Value of Equity t_{-1} (?)		0.000 (0.053)*	0.000 (0.054)*	0.000 (0.054)*	0.000 (0.058)*	0.000 (0.070)*
Market-to-book t_{-1} (+)		-0.006 (0.822)	-0.006 (0.822)	-0.006 (0.818)	-0.006 (0.827)	-0.003 (0.916)
Leverage t_{-1} (+)		0.996 (0.015)**	0.996 (0.015)**	0.996 (0.015)**	0.991 (0.016)**	0.987 (0.017)**
Industry dummy (+)		0.457 (0.003)***	0.457 (0.003)***	0.457 (0.003)***	0.457 (0.003)***	0.467 (0.002)***
Inclusion of Year Dummies	No	Yes	Yes	Yes	Yes	Yes
Observations	8208	8208	8208	8208	8208	8208
McFadden's Pseudo R2	0.017	0.053	0.0689	0.052	0.052	0.054

TABLE 5

Logit Regressions: Robustness Tests and Other Specifications

The dependent variable is one if the fiscal year was restated and zero otherwise. Option sensitivity is the change in option value for a 1% change in stock price. The sensitivity of equity and restricted stock is the change in the value of these instruments for 1% change in stock price. LTIP payouts have been normalized by total compensation. Salary-Bonus sensitivity is the change in cash compensation for a change in earnings. Market-to-book is total assets – book value of equity + market value of equity/total assets. Leverage is short-term debt + long term debt/ total assets. The industry dummy is set to one if the firm is in two-digit SIC industries 35, 36, 38 and 73. Finance raised is the cash raised from the issuance of common stock, preferred stock and long-term debt scaled by total assets. CEO tenure is the number of years as CEO of the firm. Abnormal option and equity incentives are measured as deviations from the optimal.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Option sensitivity (+)	0.173 (0.001)***	0.189 (0.000)***	0.248 (0.000)***	0.264 (0.000)***	0.176 (0.000)***	0.15 (0.029)**		
Abnormal Option Sensitivity (+)							0.192 (0.008)***	0.120 (0.113)
Sensitivity of Restricted stock (insignificant or -)	-0.000 (0.152)	-0.000 (0.109)	-0.000 (0.172)	0.000 (0.501)	-0.000 (0.105)	-0.000 (0.088)	-0.020 (0.679)	-0.029 (0.523)
Long term incentive payouts (insignificant or -)	0.917 (0.239)	0.725 (0.347)	0.382 (0.616)	0.433 (0.570)	0.389 (0.652)	0.392 (0.649)	-0.000 (0.416)	-0.000 (0.330)
Sensitivity of Equity (insignificant or -)	-0.000 (0.111)	-0.000 (0.259)	-0.000 (0.279)	-0.000 (0.274)	-0.000 (0.24)	-0.000 (0.168)	0.529 (0.525)	0.922 (0.264)
Abnormal Equity Sensitivity (-)							-0.085 (0.875)	0.443 (0.383)
Salary-bonus Sensitivity (+)	-0.158 (0.783)	-0.722 (0.210)	-0.470 (0.408)	-0.638 (0.461)	-0.001 (0.998)	0.01 (0.986)		
Market Value of Equity $t-1$ (?)	0.000 (0.047)**	0.000 (0.109)	0.000 (0.046)**	0.000 (0.080)*	0.00 (0.068)*	0.000 (0.06)*	0.000 (0.001)***	0.000 (0.003)***
Market-to-book $t-1$ (+)	-0.003 (0.897)	0.001 (0.960)			-0.001 (0.973)	-0.001 (0.986)	0.035 (0.017)**	0.013 (0.503)
Leverage $t-1$ (+)	1.099 (0.009)***	0.614 (0.132)	0.938 (0.015)**	0.788 (0.040)**	0.987 (0.017)**	0.979 (0.018)**	0.413 (0.336)	0.663 (0.135)
R&D + Advertising Expense/ Total Assets (+)		-0.152 (0.853)						
Long term Growth Forecast (+)				0.008 (0.588)				
S&P Mean Market-to-Book (+)			0.099 (0.076)*					
Finance Raised (+)	-0.069 (0.680)							
CEO Tenure (+)					0.001 (0.92)	-0.017 (0.548)		
CEO Tenure * Option Sensitivity (+)						0.004 (0.506)		
Industry dummy (+)	0.556 (0.000)***				0.408 (0.009)***	0.408 (0.009)***		0.525 (0.002)***
Inclusion of Year dummies	Yes	Yes	No	No	Yes	Yes	No	Yes
Observations	8208	8208	8208	8208	7550	7550	6818	6818
McFadden's Pseudo R2	0.053	0.049	0.018	0.017	0.048	0.047	.007	0.04

TABLE 6

Togit Regressions: Effect of Option Sensitivity on Size of Restatement

The dependent variable is the absolute value of the size of the restatement. The size of the restatement is the absolute average annual effect of restatements on earnings normalized by the restated value of the earnings. The variable takes the value of zero for non-restated years. Option sensitivity is the change in option value for a 1% change in stock price. The sensitivity of equity and restricted stock is similarly defined as the change in the value of these instruments for 1% change in stock price. Long term incentive payouts have been normalized by total compensation. Salary-Bonus sensitivity is measured as the coefficient of a cross-sectional regression at the two-digit industry level of the change in salary and bonus on the change in earnings. Market-to-book is total assets – book value of equity + market value of equity/total assets. Leverage is short-term debt + long term debt/ total assets. The industry dummy is set to one if the firm is in two-digit SIC industries 35, 36, 38 and 73. These industries are highly represented in the restating sample. A constant and year dummies for years 1995 through 2001 were included and have not been reported here. They were all significant. Predicted signs are in parenthesis. ***, **, * represent significance at the .01, .05 and .10 significance levels, respectively

	Model 1	Model 2
Option sensitivity (+)	0.067 (0.00)***	0.040 (0.037)**
Sensitivity of Restricted stock (insignificant or -)	-0.000 (0.840)	-0.000 (0.837)
Long term incentive payouts (LTIP) (insignificant or -)	0.305 (0.251)	0.380 (0.166)
Sensitivity of Equity (insignificant or -)	-0.000 (0.570)	-0.000 (0.532)
Salary-bonus Sensitivity (+)	-0.296 (0.373)	-0.143 (0.680)
Market Value of Equity $t-1$ (?)		0.000 (0.342)
Market-to-book $t-1$ (+)		-0.004 (0.697)
Leverage $t-1$ (+)		0.332 (0.052)*
Industry dummy (+)		0.158 (0.008)***
Year Dummies	No	Yes
Observations	8121	8121
R2	0.004	0.03

TABLE 7

Effect of Option Convexity on the Incentives to Misreport

The dependent variable is one if the fiscal year was restated and zero otherwise. Option sensitivity is the change in option value for a 1% change in stock price. Sensitivity of vested (unvested) options is the change in the value of vested (unvested) option portfolio for a 1% change in stock price. The sensitivity of equity and restricted stock is similarly defined as the change in the value of these instruments for 1% change in stock price. Long term incentive payouts have been normalized by total compensation. Salary-Bonus sensitivity is measured as the coefficient of a cross-sectional regression at the two-digit industry level of the change in salary and bonus on the change in earnings. Market-to-book is total assets – book value of equity + market value of equity/total assets. Leverage is short-term debt + long term debt/ total assets. The industry dummy is set to one if the firm is in two-digit SIC industries 35, 36, 38 and 73. These industries are highly represented in the restating sample. Gamma is the second derivative of option value with respect to stock price. A constant and year dummies or years 1995 through 2001 were included and have not been reported here. They were all significant. The regressions comprise 243 restated firm years. The predicted signs are in parenthesis. ***, **, * represent significance at the .01, .05 and .10 significance levels, respectively

	Model 1	Model 2
Option sensitivity (+)	0.175 (0.000)***	
Option Convexity (Gamma) (+)	0.005 (0.000)***	
Sensitivity of Vested Options (+)		0.145 (0.000)***
Sensitivity of Unvested Options (+)		-0.034 (0.506)
Gamma of vested Options (+)		0.042 (0.255)
Gamma of unvested Options (+)		0.245 (0.000)***
Sensitivity of Restricted stock (insignificant or -)	-0.000 (0.152)	-0.000 (0.210)
Long term incentive payouts (LTIP) (insignificant or -)	0.979 (0.191)	1.101 (0.145)
Sensitivity of Equity (insignificant or -)	-0.000 (0.101)	-0.000 (0.154)
Salary-bonus Sensitivity (+)	-0.232 (0.686)	-0.235 (0.688)
Market Value of Equity $t-1$ (?)	0.000 (0.247)	0.000 (0.373)
Market-to-book $t-1$ (+)	-0.002 (0.934)	0.009 (0.723)
Leverage $t-1$ (+)	0.891 (0.030)**	0.764 (0.068)*
Industry dummy (+)	0.482 (0.002)***	0.566 (0.000)***
Inclusion of Year Dummies	Yes	Yes
Observations	8208	8208
McFadden's Psuedo R2	0.06	0.067

TABLE 8
Announcement Period Returns and Exercise Activity

Panel A: Cumulative abnormal returns around announcement (CARs)		
CARs have been estimated using a standard market model regression, with the estimation period as 397 to 127 days prior to the event date. Z-statistics are reported in brackets.		
	<u>Mean</u>	<u>Median</u>
(-120,120)	-24.96	-6.12
[z-stat] p-value	[8.11] (0.000)***	(0.071)*
(-10,10)	-11.6	-5.05
[z-stat] p-value	[10.94] (0.000)***	(0.000)***
(-5,5)	-9.94	-5.06
[z-stat] p-value	[12.53] (0.000)***	(0.000)***
(0,1)	-7.04	-2.43
[z-stat] p-value	[22.96] (0.000)***	(0.000)***
(-1,1)	-8.78	-3.85
[z-stat] p-value	[21.67] (0.000)***	(0.000)***

Panel B: Exercise Activity in the initial year of misreporting	
Exercise Activity is measure as the market value of options exercises in the initial year of misreporting scaled by lagged market value of the firm.	
Q1	0.00
Mean	0.11
Median	0.00
Q3	0.04

Panel C: Regression of CARs (-5,5) of Exercise Activity								
The dependent variable is the (-5,5) day CAR. Exercises are the market value of option exercises in the misreported period scaled by lagged market value of the firm. Leverage is the ratio of short-term and long-term debt to total assets. Magnitude is the ratio of the absolute value of the average annual impact of the restatement on net income to restated net income. Predicted signs are in parenthesis								
	Intercept	Exercises	Leverage	Market Value	Market to Book	Magnitude	Adjusted R-square	N
		(-)	(-)	(+)	(-)	(+)		
Coefficient	-0.000	-0.257	-0.135	0.001	-0.002			
P-value	(.469)	(0.000)***	(.272)	(.008)**	(0.696)		0.261	146
Coefficient	-0.000	-0.205	-0.299	0.002	-0.008	0.003		
P-value	(0.977)	(0.000)***	(0.085)	(0.004)**	(0.260)	(0.864)	0.311	97