STOCK OPTIONS: TO EXPENSE OR NOT TO EXPENSE. A COMPARISON OF ECONOMIC DETERMINANTS, FIRM PAYOFFS, AND PAY- PERFORMANCE SENSITIVITY OF EXECUTIVE STOCK OPTION COMPENSATION

by

BARBARA WOOD

Presented to the Faculty of the Graduate School of

The University of Texas at Arlington in Partial Fulfillment

of the Requirements

for the Degree of

DOCTOR OF PHILOSOPHY

THE UNIVERSITY OF TEXAS AT ARLINGTON

December 2005

ACKNOWLEDGEMENTS

First and foremost, I want to express my love and gratitude to my husband, Brett, and my children, Will and Michael, for their support and unconditional love during this academic journey. I could not have successfully completed the course work, examinations, and dissertation without their prayers and encouragement.

I am also appreciative of the input provided by Melissa Lind during the last 4 years. Our thought-provoking discussions lead me to see my research from a different perspective. Melissa is a wonderful friend who inspired me to continue when I was discouraged. My thanks also to Ernie Jackson for the great meals he provided throughout this endeavor. In addition to the excellent cuisine, Ernie provided encouragement and a realistic perspective on the doctoral process that allowed me to see through the minutiae.

My final words of appreciation are for Dr. Salil Sarkar who always finds something good in any situation. Thanks for not being mad or discouraged when I erred. Thanks also for your positive attitude and confidence in me, when often I did not have confidence in myself. You are a great Dissertation Advisor.

I want to dedicate this dissertation to my Dad, Ray Kruse. He did not live long enough to see me complete this final piece of my education. But during his lifetime, he was a supportive father who encouraged me to believe I could accomplish anything!

October 15, 2005

ABSTRACT

STOCK OPTIONS: TO EXPENSE OR NOT TO EXPENSE. A COMPARISON OF ECONOMIC DETERMINANTS, FIRM PAYOFFS, AND PAY- PERFORMANCE SENSITIVITY OF EXECUTIVE STOCK OPTION COMPENSATION

Publication No. _____

Barbara Wood, PhD.

The University of Texas at Arlington, 2005

Supervising Professor: Salil K. Sarkar

Until June 2005, firms had a choice in accounting for stock option compensation. The majority of firms elected to disclose option compensation expense in the footnotes of their financial statements. However, after the accounting scandals in the early 2000s, many firms moved from disclosing the expense to recognizing the expense as a charge against earnings. This research examines the reasons that firms would voluntarily elect to adopt option recognition prior to regulatory requirement. The decision to recognize option pay is examined with respect to efficient contracting, earnings management, and information signaling.

Firms that elect to expense option pay do so to reduce political costs and potential debt covenant violations. These firms also have greater earnings and lower option costs, reducing the impact of the recognition decision. From an information signaling perspective, firms with greater growth opportunities and greater insider ownership of the firm's stock use their recognition decision to reveal their firm's favorable prospects.

Examination of the use of option compensation by firms that voluntarily choose to expense option pay and firms that do not reveals that expensing firms are high quality firms that use option compensation more effectively. The payoff relationship between executive option pay and operating income shows diminishing returns for non-expensing firms and a linear relation for expensing firms, suggesting that non-expensing firms may be over-granting option pay. Additionally, the incentive value of CEO option grants for expensing firms is more closely aligned with shareholder interests than for non-expensing firms.

The economic determinants of executive option grants is similar for expensing and non-expensing firms. The residuals from the economic determinants model are used as an explanatory variable in a logistic regression model examining the decision to expense option compensation. Positive residuals indicate the firm grants options in excess of the level predicted by the economics determinants model. Firms over-granting option compensation would be less inclined to increase the transparency of their option program by moving the cost information into the firm's financial statements. The model

shows that firms that over-grant executive stock options are less likely to voluntarily recognize option pay.

TABLE OF CONTENTS

Appendix

LIST OF ILLUSTRATIONS

LIST OF TABLES

CHAPTER 1

INTRODUCTION

In 1995, the Financial Standards Accounting Board (FASB) issued SFAS 123, Accounting for Stock-based Compensation, providing guidelines for accounting for stock option compensation. FASB allowed firms to choose whether to recognize stock option compensation as a charge against earnings or to disclose option compensation information in the footnotes of their financial statements. The decision for all but five firms was to disclose this information in the footnotes. Not until the summer of 2002 did firms begin to rethink their disclosure decision. Following the accounting scandals of the early 2000s, attention of investors, media, and regulators turned to option compensation accounting. By the summer of 2003, over 150 firms had moved from disclosure of option compensation to recognizing the cost directly in the financial statements even though expensing stock option compensation reduced reported earnings.

The accounting system requires firms to make choices on valuation and reporting methods. On an annual reporting basis, firms make choices in several areas, including inventory valuation, depreciation method, interest treatment, and investment tax credit application. Similarly, firms often decide when to adopt new accounting standards within a window provided by the regulatory body. Research has shown

several factors affect the firm's decision as to how to implement accounting policy or when to adopt a regulatory policy. An examination of previous research on accounting choice provides insight as to the reasons firms choose to recognize option compensation before FASB requires such action.

Accounting choice is defined as "any decision whose primary purpose is to influence (either in form or substance) the output of an account system in a particular way, including not only financial statements published in accordance with GAAP, but also tax returns and regulatory filings" (Fields et al., 2001; page 256). The choices firms make with respect to accounting guidelines can have economic consequences if the changes alter the cash flows for the firm or impact stakeholders that use the numbers for contracting or decision-making.

Of specific interest in accounting choice research are the choices among equally acceptable accounting alternatives and the choice as to when to adopt regulatory guidelines within the window of time provided by the regulatory body. Voluntary accounting choices among acceptable alternatives include inventory valuation (LIFO versus FIFO), depreciation schedule (straight-line versus accelerated), interest treatment (capitalize versus expense), investment tax credit (flow through versus deferral), oil and gas exploration costs (successful efforts versus full cost), and unfunded pension liability (length of amortization period). Firms select the accounting alternative to meet objectives associated with efficient contracting, earnings management, and information signaling.

Objectives under efficient contracting are to maximize firm value by minimizing political exposure and agency costs of the firm. Political exposure for the firm comes from attention by the media, consumers, regulators, and investors. The connection between political exposure and accounting performance does not depend on explicit contracts but rather on the accounting numbers used by parties external to the firm. Typically, firms that are large and more profitable bear higher political costs because of greater attention from outsiders. Additionally, firms awarding high levels of executive compensation are often subject to increased scrutiny. Intense focus on the firm raises concerns about additional regulation and taxation levied by bureaucrats and politicians. Changes in reported assets and earnings increase the probability of additional taxes or subsidies. Firms reporting higher earnings are concerned that regulators will place tighter constraints on their operations. To minimize the political exposure, management has the incentive to choose accounting techniques that lower reported income and thereby reduce political visibility.

Hagerman and Zmijewski (1979) use firm size as a proxy for political exposure and find large firms make accounting choices that reduce reported income. Specifically, large firms tend to use accelerated depreciation rather than straight-line depreciation as well as the deferral method for investment tax accounting. Prior to the requirement to expense research and development costs (SFAS 2, Accounting for Research and Development Costs, 1974), larger firms elected to expense R&D costs to minimize reported income. Smaller firms, less impacted by political exposure, capitalized their research costs (Daley and Vigeland, 1983). Similarly, Lilien and

Pastena (1982) find that larger oil and gas firms selected the successful efforts method when accounting for exploration and development costs. Clearly, reducing political costs is a consideration in choosing among accounting alternatives.

Accounting choices can impact the agency costs associated with debt contracts. Jensen and Meckling (1976) state a firm can reduce agency costs by incorporating debt into its capital structure. However, excessive debt leads to the potential for bankruptcy. Debt holders of the firm also realize the potential wealth transfer from bondholders to shareholders if management is not properly constrained. Therefore, debt holders contractually limit managerial actions by enacting covenants as a part of the lending agreement. These covenants often take the form of establishing target ratios based on accounting numbers. Violation of covenants can force the firm into bankruptcy. Understanding the increased agency costs associated with covenant violation, management has the incentive to make accounting choices that avoid covenant breaches or loosen closeness to covenant violation.

Debt covenants often include restrictions on debt ratios for the firm. Firms with more debt in their capital structure tend to have more accounting-based constraints in their debt covenants. For these firms, leverage is correlated with the closeness to constraints in debt covenants (Press and Weintrop, 1990). While there are several debt ratios that can be considered in debt covenants, Duke and Hunt (1990) find that debt-equity ratio is a suitable proxy for debt covenant restrictions related to retained earnings and net tangible assets. Firms that are close to breaking debt covenant limitations benefit by making income increasing accounting choices to lower violation potential.

Sweeney (1994) and DeFond and Jiambalvo (1994) find firms that had violated debt covenants made choices on accruals or accounting alternatives that increased income in the period prior to the violation. Other researchers use leverage ratios as proxies for closeness to covenants and find highly levered firms implement accounting alternatives that increase reported income, reducing the potential covenant breach (Dhaliwal, 1980; Zmijewski and Hagerman, 1981; Lilien and Pastena, 1982; Daley and Vigeland, 1983).

Accounting choices are often used as a way to manage a firm's reported earnings. Earnings management is used for income smoothing or for optimizing incentive compensation. Hand and Skantz (1998) examine the accounting for carve-out gains per SEC Staff Accounting Bulletin 51 (SAB 51: Accounting for Sales of Stock by a Subsidiary). Under SAB 51, firms can take the gain from an equity carve-out as non-operating income or as an addition to equity. Firms that take a large write-off against income in the year of the carve-out are more likely to report the gain on the income statement.

Since management bonuses are often tied to reported earnings, managers have an incentive to choose the accounting method that maximizes bonus pay. Hagerman and Zmijewski (1979) examine the impact of management incentive plans on accounting choices and find firms with compensation plans tied to accounting results select income increasing alternatives such as straight-line depreciation and longer amortization period for pension costs. In a similar study, Zmijewski and Hagerman (1981) consider the impact of joint decisions by management for depreciation schedule, inventory valuation, pension costs, and investment tax credit accounting. Prior research

considered each accounting choice as independent alternatives; however, the consequences of one choice can affect the decision for another. When examining the choices as joint decisions, Zmijewski and Hagerman find stronger evidence that management compensation plans encourage the choice of income increasing accounting alternatives. In a review of accounting choice research, Holthausen and Leftwich (1983) find management bonus plans with payout based on earnings strongly influence accounting choice.

Accounting choice can be used to convey management's private information about the firm's future cash flow to the marketplace. If managers' reputations and wealth are affected by firm performance, they have an incentive to effectively communicate private information that reveals firm value. Managers of healthy firms signal the firm's strength and greater future cash flows by their choice of accounting alternatives. Managers expecting high future earnings signal this information by taking the gain from a carve-out into the income statement when implementing SAB 51 (Hand and Skantz, 1998).

In addition to choice of accounting methods, firms make decisions about when to adopt accounting regulations. FASB typically allows for an extended adoption period between the date the standard is promulgated to the date when compliance is required. This window of adoption allows firms to manage implementation issues, especially if contracts must be renegotiated (Langer and Lev, 1993). Thus, within this interval, firms can time the actual adoption date to maximize benefits or minimize costs.

Many of the factors that influence a firm's choice of accounting alternatives also affect the decision to adopt an accounting standard before the mandatory implementation date.

Whether a firm adopts an accounting regulation prior to the mandated implementation date is influenced by the political costs borne by the firm. Scott (1991) and Langer and Lev (1993) find that firms with greater political costs implemented SFAS 87 (Employers' Accounting for Pensions) prior to the mandated adoption date. By reducing reported earnings, the firms lowered the costs stemming from criticism of excessive profits. The effect of SFAS 52 (Foreign Currency Translation) was to move foreign currency translation from the income statement to the balance sheet. Clearly, this standard would increase income when implemented. Large firms were late adopters of this standard since adoption increased political visibility of the firm by increasing reported earnings (Ayres, 1986).

Adoption timing of new accounting standards is also influenced by firm leverage. Firms with more leverage are more likely to be early adopters of income-increasing standards and less likely to be early adopters of standards that reduce earnings. Firms closer to debt covenant violation were more likely to be early adopters of income-increasing SFAS 52 and late adopters of income-decreasing SFAS 106 (Employers' Accounting for Postretirement Benefits Other than Pensions) (Ayers, 1986; Amir and Ziv, 1997a). For these firms, reducing the potential of covenant violation was an important factor in the timing of the adoption. A firm's leverage position did not influence the adoption timing for SFAS 87 (Scott, 1991). Scott speculates the reason

that highly levered firms were not impeded in adopting SFAS 87 was because the impact to the balance sheet was minimal.

A firm's decision on adoption timing can be influenced by the firm's current earnings level as well as the impact of the standard adoption on reported earnings. If investors prefer stable earnings then firms may time adoption of income-decreasing (income-increasing) standards in periods of high (low) profits. However, if earnings are substantially lower than expected, firms may elect to adopt income-decreasing standards to further reduce earnings, taking a 'bath' in the current period with expectations of improved earnings in subsequent periods. Early-adopters of SFAS 106 reported lower earnings in the year prior and post adoption, consistent with the big bath hypothesis rather than income smoothing (Amir and Livnat, 1993). Scott (1991) finds similar results for SFAS 87 adoptions: firms with negative income were less likely to adopt SFAS 87 even though it would increase reported earnings. However, the impact of standard adoption on reported earnings also affects the timing of adoption. Scott (1991) and Langer and Lev (1993) find the greater the impact on earnings from the adoption of SFAS 87, the more likely firms would adopt the standard early.

The effect of adoption timing on reported earnings has implications for management bonus payments. Bonus plans are often bounded, where no payment is made if results are below a given target and payment is capped at an upper target. In this situation management has an incentive to increase earnings but not by an amount that is greater than the upper target. Early adopters of SFAS 52 had smaller increase in earnings in the period prior to adoption than did a control group that did not adopt early.

Managers appear to time adoption to maintain a certain level of earnings growth while staying below the upper target (Ayres, 1986). When allocation to a firm's bonus plan was computed using an income-based formula and current income was within the payout bounds, the firm was more likely to increase income by adopting SFAS 87 early (Scott, 1991).

Firms communicate private information about the long-term effect of the standard on the firm's value through adoption timing. Amir and Ziv (1997b) develop a model that shows managers' private information about the effect of the standard on firm value is conveyed through their decision on adoption timing. If management information is favorable, they will choose to adopt early. Unfavorable information is communicated by a decision to delay adoption as long as possible buying time to renegotiate underlying debt and compensation contracts. Amir and Livnat (1993) consider the information communicated by adoption timing of SFAS 106. Prior to adoption of the standard, investors could estimate postretirement benefits (PRB) liability for the firms using reported cash flows to retirees. SFAS 106 requires firms to report the actual PRB liability. If managers perceive the market's assessment of the PRB is greater than the actual PRB, then adopting the standard sends a credible signal to investors about the true obligation of the firm. Results from their research show firms choose early adoption when the actual pension obligation under the standard is smaller than the market estimate of the obligation.

This research examines factors influencing firms' decisions to announce their intent to recognize stock option compensation. The decision to change from disclosure

of stock option compensation to recognizing the compensation expense is an example of accounting choice as well as adoption timing. The choice of recognition or disclosure has been available to the firm since SFAS 123 was released in 1995. However, in the summer of 2002 public support for a change in option compensation accounting was intensifying and firms began to reconsider their accounting decision. Efficient contracting, earnings management, and information signaling theories of accounting choice and adoption timing can be used to explain the decision to change from disclosure of option compensation to recognition.

Two components of efficient contracting that consistently explain accounting choice and adoption timing are political costs and leverage. Given the media, investor, and regulatory attention on option compensation in the early 2000s, firms may have assessed high political costs associated with this compensation issue. To curtail the criticism of option compensation, especially for executives, firms bearing high political costs elected to recognize option compensation. Although stock option recognition decreases reported income, highly levered firms benefit from option recognition. The net result of expensing stock option compensation is an increase in owners' equity by an amount equal to the value of deferred taxes on the stock-based compensation expense. Consequently, a firm's debt-equity ratio is lower after recognizing option compensation. The efficient contracting perspective implies:

1. Firms with greater political costs will elect to recognize option compensation.

2. Highly levered firms will elect to recognize option pay to reduce potential debt covenant violations.

Earnings management theory of choice considers the effect of the standard on reported earnings and the effect on compensation linked to earnings. As the impact of the standard on reported earnings increases favorably (unfavorably), the likelihood of selecting the accounting method increases (decreases). The predictions from the earnings management theory of account choice are:

3. Firms with greater earnings will choose option recognition.
4. As the cost of option compensation increases, the probability of option recognition decreases.
5. The greater the portion of executive pay from bonus, the less likely the firm will elect to recognize option compensation.

Firms can use option recognition as a way to provide additional information to investors. Managers can reveal their private information about firm prospects through their decision to recognize stock option compensation. Although option compensation expense is disclosed in financial statement footnotes, the benefits to the firm of this incentive pay are less transparent. The decision to recognize option pay can serve as a signal of management's knowledge of the payoffs from stock option awards. Payoffs from option grants come in the form of increased income for the firm and higher incentive quality for the executive. The level of stock option grants should be set to optimize the payoff to the firm. Firms realizing greater payoffs from option grants can

communicate this favorable information through a decision to recognize the cost. The predictions from the signaling function of accounting choice are:

6. Firms recognizing option compensation realize greater payoffs from stock options in the form of greater earnings.
7. Stock option pay has greater incentive quality in firms that decide to recognize the expense.

The level of stock option pay should be set to optimize the incentive benefit from this form of compensation. Compensation may initially be set at its optimal level, but over time equity incentives can become misaligned with desired level due to changes in either firm or manager characteristics that determine optimal incentive level. Because recontracting with managers can be costly, firms may allow incentives to remain misaligned until the benefits from realignment exceed the cost to do so (Core et al., 2003).

However, it is also possible that misalignment in incentive pay occurs when executives have control over their pay process and use that influence to set pay in excess of optimal levels. Since stock option pay is disclosed in footnotes of a firm's financial statements rather than recognized in reported expenses, option compensation is a less visible way to increase pay (Hall and Liebman, 1998). As management gains power over the pay process, executives are able to extract additional compensation from the firm. Core et al. (1999) find that CEOs at firms with greater agency costs earn higher levels of compensation. Moreover, these firms exhibit poorer performance.

Firms that grant option pay to maintain optimal incentive value to the firm can use the expensing decision to reveal their effective use of stock options. Firms that use option compensation to extract rents through excessive use of grants would be less inclined to increase the transparency of their option program by recognizing the option values. Therefore, the final hypothesis under evaluation is:

8. Options are granted more effectively by firms that recognize option compensation.

This research contributes to the literature by extending the theories on accounting choice and adoption timing to accounting for stock option compensation and adoption of SFAS 123. Additionally, the research expands extant knowledge by considering how accounting choices reveals private information on optimal level of option grants and payoffs from this incentive compensation.

CHAPTER 2

TO EXPENSE OR NOT TO EXPENSE

2.1 The decision to expense

Accounting for option compensation has been a topic of debate since Accounting Principles Board Opinion 25 (APB 25) was issued in 1972. APB 25 defines stock option expense as the difference between the stock price and the exercise price on the measurement date times the number of options granted. The option expense is recognized over the vesting period of the grant. Since most firms grant options with the exercise price equal to the stock price, the option has no accounting value, so no option expense is incurred. Soon after the release of APB 25, Black and Scholes (1973) developed an option pricing model and demonstrated the value of an option is more than just the intrinsic value; the time value component of the option increases the value of the option beyond its intrinsic value.

In 1984, the Financial Accounting Standards Board (FASB) concluded that stock option compensation was indeed an expense to the firm. It issued an exposure draft in 1993 indicating the value of stock option compensation should be calculated using an option pricing model, such as the Black-Scholes model, rather than the intrinsic value method outlined in APB 25. Using the FASB proposed valuation method, firms would be required to record option expense on their income statements. The proposal was opposed by major corporations, the Big 6 Accounting firms, and

legislators. To appease opponents, FASB retreated from its position on expensing stock option pay in its 1995 release of SFAS 123, which allowed firms the choice of recognizing stock option expense or merely disclosing the information in footnotes of its annual report. As of July 2002, only five major U.S. firms had elected to recognize option compensation expense on their income statements: Boeing Company, Hawaiian Electric Industries, Level 3 Communications Inc., MacDermid Chemical, and Winn-Dixie Stores Inc.

Stock option compensation has become an increasingly important component of executive pay in the past two decades as a greater portion of executive compensation is derived from stock option grants. In 1980 stock option compensation accounted for 20% of CEO compensation; this figure grew to almost 50% by 1994 (Hall and Liebman, 1998). By 2000, median CEO stock option compensation ranged from 20% of total compensation for small firms to 62% for large firms (Balsam, 2002). The increasing popularity of stock option compensation can be attributed to its favorable accounting treatment (Murphy, 1999).

In the early 2000s, investors came to suspect that lack of transparency in option compensation accounting procedures led to excessive option compensation. As Financial Accounting Standards Board (FASB) reconsidered the accounting alternatives in SFAS 123, firms began to voluntarily recognize stock option compensation prior to any mandate by FASB. Between July 2002 and August 2003, 151 firms publicly declared their intent to recognize option compensation. Implementation of this income-decreasing accounting alternative can be explained by theories of accounting choice and

adoption timing.[1] Accounting choice and adoption timing research examines the decision of firms' choice of alternate accounting treatments and of standard adoption timing along three dimensions: efficient contracting, earnings management, and information signaling. Differences between firms announcing their intent to recognize stock option compensation (expensing firms) and firms that did not make such an announcement (non-expensing firms) are identified in this chapter.

Efficient contracting considers the political costs and leverage restrictions of the firm. Larger, more profitable firms incur political costs from greater scrutiny by the media, regulators, and investors. Increased exposure for firms raises concerns about imposition of additional regulations and taxes. Firms bearing greater political costs often select accounting alternatives that decrease reported earnings (Hagerman and Zmijewski, 1979; Lilien and Pastena, 1982; Daley and Vigeland, 1983). The elevated attention on corporate compensation practices in 2002 increased the political exposure for firms. The decision to recognize option compensation could serve to reduce political fallout from perceived excesses in pay. If political costs are a consideration in the decision to expense options, then firms with high political costs would be more likely to expense option compensation.

Highly levered firms can benefit by recognizing stock option compensation. If a firm is close to violating debt covenant restrictions, expensing stock option pay can

[1] In August 2003, accounting for stock options was still a choice for the firms since SFAS123 was still in effect allowing recognition or disclosure. However, the climate appeared such that FASB would be able to revise SFAS 123 so that option compensation would have to be recognized. Perhaps the decision to expense options was an adoption timing decision in anticipation of the enactment of the revised standard.

alleviate the potential violation. Using leverage as a measure of closeness to debt covenant restrictions, accounting choice research finds highly levered firms choose accounting methods that reduce the potential of violating debt restrictions (Dhaliwal, 1980; Zmijewski and Hagerman, 1981; Sweeney, 1994; DeFond and Jiambalvo, 1994). Although expensing option compensation reduces reported income, the effect on the equity section of the balance sheet is to increase equity by an amount equal to the deferred taxes on the option expense. If a firm's debt covenants include a limit on its debt-equity ratio, recognizing options increases the gap between firm performance and covenant violation.[2] Highly levered firms will, therefore, be more likely to expense option compensation.

Hypotheses from efficient contracting perspective are:

1. Firms with greater political costs will elect to recognize option compensation.
2. Highly levered firms will elect to recognize option pay to reduce potential debt covenant violations.

Earnings management perspective of accounting choice considers the firm's profitability, the impact of the choice on reported earnings, and the implications of the choice on management bonus. The decision on accounting treatment or adoption timing is influenced by the firm's current profitability. Firms reporting higher earnings are better able to accommodate an accounting method that decreases income (Amir and Livnat, 1993; Hand and Skantz, 1998). The impact of the accounting method on

[2] Smith (1993) finds the most frequently violated debt covenants are those restrictions on a firm's net worth.

reported earnings is also a determinant of choice. Accounting treatments that result in small reductions in earnings are more likely to be implemented than choices having a large reduction in earnings (Scott, 1991; Langer and Lev, 1993). Since option expense lowers reported earnings, firms with greater earnings and lower option costs would be more apt to expense options.

The choice of accounting alternatives is a consideration when bonus compensation is at risk. An accounting method that decreases reported income is less likely to be used if the reduction in earnings affects bonus payout (Hagerman and Zmijewski, 1979; Zmijewski and Hagerman, 1981; Holthausen and Leftwich, 1983). As the portion of compensation derived from bonus pay increases, the probability a firm will decide to recognize option pay decreases.

Earnings management theory suggests these hypotheses:

3. Firms with greater earnings will choose option recognition.
4. As the cost of option compensation increases, the probability of option recognition decreases.
5. The greater the portion of executive pay derived from bonus, the less likely the firm will elect to recognize option compensation.

Selection of an accounting choice with a negative impact on earnings is costly to the firm. However, managers possess private information about the firm's future prospects and can use their accounting choice to reveal this information to the investors. High quality firms expecting favorable future earnings can afford to choose accounting methods that reduce earnings. Firms of lesser quality find it too costly to mimic the

behavior of high quality firms. Stock option recognition unambiguously lowers reported earnings; therefore, the decision to voluntarily expense option pay is a costly choice affordable only to high quality firms.

Accounting choice theory finds managers make decisions on accounting alternatives and adoption timing to reveal private information (Amir and Ziv, 1997b). The information conveyed in the accounting choice may be a clarification of market perception about the effect of the choice or a signal of higher future earnings (Amir and Ziv, 1997b; Hand and Skantz, 1998). The decision to expense stock options can signal the firm's knowledge of the cost effectiveness of its option program. Firms with benefits from option compensation exceeding its cost will be more inclined to recognize option pay.

The hypothesis pertaining to the information signaling aspect of account choice is:

6. Firms that elect to expense stock option pay use the expensing decision to signal that they are high quality firms.

2.2 Measurement of theoretical variables

Efficient contracting variables include measures of political cost and leverage. Political cost is a function of firm size (*size*) and is measured as the natural log of market value of equity. Larger firms bear greater political cost because of the increased attention to firm performance by outsiders. Leverage is used as an indicator of the firm's closeness to debt covenant violations. Duke and Hunt (1990) determine a firm's

debt-equity ratio is a suitable proxy for restrictive debt covenants imposed by creditors. In this model, *leverage* is measured as the natural log of debt-equity ratio.

Variables associated with the earnings management theory of accounting choice include measures of the firm's current and future earnings, impact of the accounting choice on earnings, and effect of choice on management bonus.

The current earnings of the firm are measured as earnings per share (*EPS*). This measure of earnings is particularly relevant since opponents of expensing options cite the impact of option costs on EPS and the subsequent reduction in stock price as concerns.[3] In addition to the level of earnings, the stability of the earnings can affect the decision to expense options. If a firm has stable earnings, management can make a better assessment of the impact of option expense on future earnings. The measure of earnings stability (*volatility*) is the standard deviation of the change in quarterly income before extraordinary items over the prior 5 years.

The future earnings potential of the firm can also impact the decision to recognize option pay. Firms with many investment opportunities may anticipate higher levels of profit, making them better able to accommodate future option expense. Moreover, the decision to recognize option pay is a signal that the firm expects greater earnings. For these reasons, firms with more growth opportunities would be more amenable to expensing stock option compensation. An alternative view of growth opportunities and the decision to expense stock option compensation suggests that firms may choose to use option compensation in lieu of cash compensation to reserve cash for

[3] To the extent that current earnings are an indicator of future earnings, earnings per share can signal the firm's earnings prospects.

investment opportunities. Accordingly, firms with more growth opportunities may be inclined to use cash for investments and stock options for compensation resulting in high levels of option compensation. If options are expensed, high growth firms would realize a greater charge to earnings and, therefore, oppose expensing option compensation. The effect of a firm's growth opportunities on the decision to voluntarily recognize option expense is uncertain and will be assessed through empirical analysis. Growth opportunities (*growth*) for the firm is measured as the natural log of book value of assets divided by market value of assets (Core and Guay, 1999).[4] The ratio of book to market value of assets is actually the inverse of the firm's investment opportunity set; therefore, smaller values of *growth* indicate more growth opportunities.

The impact of accounting choice on earnings is evaluated using several variables. The proportion of executive compensation from options is an indicator of option expense. The greater the portion of pay derived from option compensation, the greater the expense to the firm. The portion of executive pay from options (*options*) is measured as the average of the option compensation as a percent of total compensation for the top five executives. Another measure of the impact of option compensation is the value of the unvested option portfolio. FASB requires option pay to be expensed over the period in which requisite services are rendered, typically the vesting period. Unvested options are charged against earnings over the vesting period; hence, the

[4] Chung and Pruitt (1994) develop an approximation for Tobin's *q* using readily available accounting variables that is nearly equivalent to theoretical measures of *q*. Their measure of market value of assets is market value of equity, plus value of preferred stock, plus current liabilities, plus long-term debt, less current assets.

portfolio of unvested in-the-money options represents the future cost of option expense. The intrinsic value of the unexercisable options for the top five executives is reported in the firm's annual proxy statement. The value of these options scaled by the market value of equity (*portfolio*) serves as a proxy for the cost of option compensation to the firm.

The more option awards granted by the firm, the greater the expected impact on reported earnings when options are expensed. A measure of the broadness of option compensation pay is proxied by examining the reported portion of total options granted to the top five executives. If the percent of options granted to the executives is large, the firm's use of options is concentrated at the executive level. If the percent is small, the firm awards options more broadly throughout the organization. There are indications that if firms are required to expense option compensation, reductions in option grants to employees below the executive ranks are likely. Compensation consulting firm Pearl Meyer and Partners suggested that if expensing were required, firms would cut options by one-third, affecting primarily employees below the executive level (*BusinessWeek,* February 3, 2003). Firms opposing option recognition say that expensing options will force them to reduce option grants to rank-and-file employees, which will diminish innovation and subsequently reduce share prices. Firms with broad-based option compensation programs have clearly indicated their opposition to expensing option pay. The percent of options granted to the top five executives (*pcnt to top*) is used as a proxy for the broadness of option pay in the firm. The greater the concentration of option grants to the top five executives, the less broad

the option compensation in the firm and the more likely the firm will decide to expense options.

The ability of the firm to reduce option expense depends on the opportunity the firm has to substitute other forms of compensation for options. Because of the riskiness of option grants, firms must pay more in option compensation than it would in fixed cash compensation. Meulbroek (2001) shows the option value to the undiversified employee is lower than the cost of the grant to the firm because of the inherent risk in the option grant. Firms also use option compensation to remain competitive in the labor market when there is insufficient cash for compensation (Core and Guay, 2001). If the firm is cash constrained it would have limited flexibility in substituting cash compensation for stock options as a means to reduce the impact to earnings. Firms that are cash constrained use more option compensation and are less likely to expense stock options. Cash flow shortage (*CF shortage*) is measured as cash flow from investing plus dividends less cash flow from operations scaled by assets (Core and Guay, 1999).

Bonus pay represents a sizeable portion of executive compensation. In 2000, bonus pay averaged 18% of total compensation to a CEO. During the period from 1993 to 2000, short-term bonuses increased at a mean (median) rate of between 20% and 106% (4% and 14%) per year (Balsam, 2002). Bonus pay is almost always contingent on measures of accounting profit. In a survey of incentive plans of 177 publicly traded U.S. corporations, over 95% of the firms report using an accounting measure target for bonus pay calculations (Murphy, 1999). The impact of an accounting change on earnings and, subsequently, bonus pay is a consideration for managers. As the portion

of pay from bonuses increases, managers will be less inclined to recognize option compensation because of the effect on earnings. Bonus pay (*bonus*) is calculated as the average of the percent compensation from bonus for the firm's top five executives.

Two additional variables are considered in evaluating the differences between expensing and non-expensing firms. The first variable controls for industry effect of stock option grants; the second controls for ownership of the firm.

New economy firms rely more extensively on stock option compensation than their old economy firm counterparts.[5] Stock-based pay is a large portion of total pay for executives in new economy firms. Furthermore, new economy firms award more option pay below the top executive level (Ittner et al., 2003; Murphy, 2003). The most vocal opponents to the recent discussion on option expensing were executives from Intel and Cisco, both new economy firms. An indicator variable (*newecon*) is included in the model to control for new economy firms.

Firm ownership enters the model as the percent of shares owned by officers and directors. Dhaliwal et al. (1982) find that firms with fewer shares held by insiders are more likely to choose accounting treatments that increase income. As ownership of stock becomes more dispersed, managers tend to take actions to increase reported earnings. A similar view suggests as more of the stock is owned by insiders, the less concerned the executives are about job termination for reporting lower earnings.

[5] New economy firms are firms with SIC codes 3570 – 3572, 3576, 3577, 3661, 3674, 4812, 4813, 5045, 5961, 7370 - 7373 (Murphy, 2003).

Therefore, these managers would not be opposed to expensing stock option compensation. Moreover, the portion of equity held by insiders signals firm quality. In their signaling model, Leland and Pyle (1977) show the market views higher managerial ownership as an indicator of favorable investment opportunities. Insider ownership (*insider*) is calculated as the shares held by officers and directors scaled by total shares outstanding.

The logistic regression model is used to analyze the difference between expensing firms and non-expensing firms.

$$Y=\beta_0 + \beta_1(\text{size}) + \beta_2(\text{leverage}) + \beta_3(\text{EPS}) + \beta_4(\text{volatility}) + \beta_5(\text{growth}) + \beta_6(\text{option}) + \beta_7(\text{portfolio}) + \beta_8(\text{pcnt to top}) + \beta_9(\text{CF shortage}) + \beta_{10}(\text{bonus}) + \beta_{11}(\text{newecon}) + \beta_{12}(\text{insider}) + \varepsilon$$

Table 2.1 summarizes the variables used in the model.

2.3 Data and descriptive statistics

On August 12, 2003, Dow Jones & Reuters reported that 151 firms had announced their intent to expense stock option compensation. These 151 firms form the set of expensing firms in the analysis. Initially, four firms are purged from the data set: three firms because they stipulate they will expense option compensation when FASB accounting standards are in place, and one firm because it indicates it will no longer use stock options in its compensation package. Of the remaining 147 firms, 46 are not covered by the ExecuComp database. Financial firms were eliminated from the data set because several variables used in the regression are not comparable for financial and non- financial firms. For example, leverage for non-financial firms indicates the portion

Table 2.1 Logistic regression model and variables

$Y=\beta_0 + \beta_1(size) + \beta_2(leverage) + \beta_3(EPS) + \beta_4(volatility) + \beta_5(growth) + \beta_6(option) + \beta_7(portfolio) + \beta_8(pcnt\ to\ top) + \beta_9(CF\ shortage) + \beta_{10}(bonus) + \beta_{11}(newecon) + \beta_{12}(insider) + \varepsilon$		
Dependent variable:		
Y = 1 if expensing firm, 0 if non-expensing		
Independent variables	Expected sign	Measure
size	+	= ln(market value of equity)
leverage	+	= ln(debt/equity)
EPS	+	= earnings per share
volatility	–	= standard deviation of change in quarterly income before extraordinary items for the prior 5 years
growth	+/–	= ln(assets/(market value of equity + preferred stock + current liabilities – current assets + long-term debt))
option	–	= average of options as a percent of total compensation for top 5 executives
portfolio	–	= value of in-the-money unvested options held by top five executives scaled by market value of equity
pcnt to top	+	= percent of options granted to top five executives
CF shortage	–	= (cash flow from investing + dividends – cash flow from operations)/assets
bonus	–	= average of bonus as a percent of total compensation for top 5 executives
newecon	–	= 1 if new economy firm, 0 otherwise
insider	+	= percent of shares outstanding held by officers and directors

of capital structure financed by debt. For financial firms, reported debt includes liabilities for deposits in the firm in addition to long-term debt used to finance the firm. Forty-two of the firms are financial services firms, leaving 59 remaining firms for the analysis. A control set of firms not announcing their intent to recognize options was obtained from firms in the ExecuComp database. After eliminating financial firms and firms with missing data, 1084 non-expensing firms remain in the sample.

The data set used in this analysis is also used in subsequent analyses (Chapter 3 and 4). In Chapter 3 option compensation for current and previous 5 years, covering the period 1993 – 2001, are used in the regression model.[6] After firm-year observations with missing data are removed, the data set consists of 1776 firm-year observations for 40 expensing firms and 545 non-expensing firms during the period 1998 – 2001.

Compensation data comes from the ExecuComp database. ExecuComp provides information reported in the firm's proxy statement. This information includes compensation data for the firm's top five executives. Other firm data is extracted from Compustat database with the exception of shares held by insiders. Data on shares owned by officers and directors is from *The Corporate Directory of U.S. Public Companies*.

Table 2.2 provides industry information for the expensing and non-expensing data sets. Panel A provides information on an industry level for each set of firms. The manufacturing sector represents more than half of the expensing and non-expensing

[6] Firms began announcing their intent to recognize stock option compensation in July 2002; therefore, fiscal year 2001 is the last year used in the analysis.

Table 2.2 Industry classification of data set

Panel A: All firms				
Industry	Expensing (number)	% of sample	Non-expensing (number)	% of sample
Agriculture, forestry, and fishing	1	2.5	1	<0.1
Mining	1	2.5	3	<0.1
Construction	1	2.5	30	5.5
Manufacturing	23	57.5	305	55.9
Transportation, communication, utilities	3	7.5	41	7.5
Wholesale and retail trade	7	17.5	83	15.2
Services	3	7.5	80	14.7
Public Administration	1	2.5	2	<0.1
Total	40	100	545	100
Panel B: New economy firms				
Industry	Expensing	% of sample	Non-expensing	% of sample
Manufacturing	1	33.3	39	43.8
Transportation, communication, utilities	1	33.3	5	5.6
Wholesale and retail trade	0	0.0	3	3.4
Services	1	33.3	42	47.2
Total	3	100	89	100

firms. The largest difference in industry representation is in the service sector. Non-expensing set has almost twice the representation than expensing firms. Panel B details the new economy firm representation by industry by data set. New economy firms represent only three firms in the expensing data set in three different industries. There are 89 non-expensing new economy firms in four industry categories. For the non-expensing data set, 90% of the new economy firms come from two industries: manufacturing and services

Table 2.3 Mean values and difference in means analysis

Variable	Non-expensing Mean/(std dev)	Expected Relation	Expensing Mean/(std dev)	p-value
size	7.557 (1.728)	<	8.854 (2.021)	<0.0001
leverage	0.164 (0.931)	<	0.828 (0.827)	<0.0001
EPS	1.107 (2.874)	<	2.356 (3.551)	<0.0001
volatility	7.064 (26.334)	>	3.321 (6.232)	<0.0001
growth	0.668 (0.398)	?	0.762 (0.367)	0.003
option	41.114 (21.515)	>	38.189 (16.529)	0.031
portfolio	0.003 (0.005)	>	0.001 (0.002)	<0.0001
pcnt to top	21.261 (16.214)	<	19.015 (15.015)	0.054
CF shortage	-0.174 (0.204)	>	-0.175 (0.122)	0.463
bonus	15.637 (11.049)	>	16.997 (11.140)	0.094
insider	8.230 (10.563)	<	9.060 (17.481)	0.300

Table 2.3 examines the difference in means for the variables under consideration. As expected, the expensing firms are larger and more levered. The level of earnings is greater and less volatile for the firms electing to expense, whereas the impact of option expense as proxied by *portfolio* is greater for the non-expensing firms. Option compensation makes up a larger percentage of executive pay for non-expensing firms, whereas expensing firms have slightly larger bonus pay as a percent of total pay. Growth opportunities are greater for non-expensing firms, while profitability measured by earnings per share is greater for expensing firms. Opponents to option expensing

suggest non-executive employees will realize the greatest reduction in option grants if firms are required to recognize option pay. Yet, firms that have decided to expense stock options have broader based option program as measured by *pcnt to top*. Non-expensing firms are more cash constrained but the difference between the datasets is not significant. The difference in shares held by insiders is not statistically different between expensing and non-expensing firms.

The Wilcoxon Rank Sums differences in medians for the same variables are shown in Table 2.4. The results are nearly identical to the difference in means except for volatility and insider ownership. Whereas mean volatility was greater for non-expensing firms, median volatility is greater for expensing firms, although not significantly so. Median insider ownership is not statistically different between the two sets of firms. Median percent of options granted to top 5 executives is still greater for non-expensing firms but not statistically different from the measure for expensing firms. The correlation coefficients for the variables in the model are provided in Table 2.5. The upper triangle represents the Pearson correlation coefficients; the bottom triangle reports the Spearman correlation coefficients. The correlation among the variables is small with the largest correlation coefficient of -0.512 between firm size and insider ownership.

Table 2.4 Median values and difference in median analysis

Variable	Non-expensing median	Expected Relation	Expensing median	p-value
size	7.512	<	8.524	<0.0001
leverage	0.232	<	0.737	<0.0001
EPS	1.238	<	1.812	<0.0001
volatility	1.395	>	1.433	0.926
growth	0.627	?	0.713	0.007
option	38.500	>	36.759	0.404
portfolio	0.001	>	0.001	<0.0001
pcnt to top	17.400	<	16.200	0.643
CF shortage	-0.172	>	-0.172	0.926
bonus	14.735	>	16.927	0.308
insider	4.138	<	2.967	0.164

Table 2.5 Correlation coefficients for logistic variables

Variable	size	leverage	EPS	volatility	option	portfolio	pcnt to top	CF shortage	growth	bonus	inside
size	*1.000*	0.127	0.242	-0.095	0.396	-0.093	-0.432	-0.200	-0.468	0.047	-0.267
leverage	0.149	*1.000*	0.082	-0.026	-0.189	-0.248	0.064	0.206	0.234	0.143	-0.132
EPS	0.331	0.200	*1.000*	-0.354	-0.048	0.012	-0.028	-0.192	-0.085	0.185	-0.089
volatility	-0.268	-0.100	-0.071	*1.000*	0.071	0.079	0.062	0.145	0.021	-0.070	0.020
option	0.387	-0.177	-0.068	0.016	*1.000*	0.213	-0.166	-0.115	-0.351	-0.447	-0.155
portfolio	-0.004	-0.205	-0.036	0.062	0.162	*1.000*	0.085	-0.051	-0.242	-0.012	0.105
pcnt to top	-0.457	0.055	-0.111	-0.017	-0.168	0.060	*1.000*	0.097	0.226	0.013	0.115
CF shortage	-0.161	0.111	-0.155	-0.032	-0.097	-0.161	0.106	*1.000*	0.217	-0.051	0.047
growth	-0.469	0.343	-0.080	0.176	-0.327	-0.381	0.253	0.360	*1.000*	0.007	0.061
bonus	0.056	0.147	0.366	-0.114	-0.466	0.054	0.019	-0.054	0.019	*1.000*	0.022
inside	-0.512	-0.232	-0.182	0.063	-0.165	0.175	0.234	0.028	0.088	-0.035	*1.000*

2.4 Regression results

Differences in means and medians of the variables under consideration provide information when each variable is considered independently. Examination of the variables in a multivariate framework is more meaningful to determine the influence on the decision to expense. Since the dependent variable is binary, a logistic regression is conducted.

The logistic regression results are shown in Table 2.6 The parameter estimates are used to calculate the odds ratio which represents the percentage change in probability of a firm expensing stock options given a one-unit change in the variable. The odds ratio for β_i is calculated as $\exp(\beta_i)$. Of interest in the parameter estimates is the sign of the parameter and the level of significance. A positive parameter indicates that an increase in the variable increases the likelihood a firm will expense option compensation; a negative parameter indicates a firm is less likely to expense option pay. However, the growth variable is an inverse measure of the firm's growth opportunities. Accordingly, a positive (negative) regression coefficient indicates the firm is less (more) likely to expense option pay.

The variables used to evaluate efficient contracting theory of accounting choice are of the expected sign and significance. Large firms are more likely to recognize option pay as a way to reduce the political costs by increasing transparency of financial statements. Highly levered firms are more likely to expense option compensation. This supports the theory that firms close to debt covenant restrictions benefit by expensing options. The greater the firm's leverage, the more likely the firm is to expense option

compensation. This result is consistent with Aboody et al. (2004b) who find that larger, more levered firms are more likely to expense option compensation.

Variables associated with earnings management give mixed results. Current earnings of the firm contribute to the decision to recognize option compensation. Firms with greater earnings per share are more likely to expense stock option pay. However, volatility of income does not influence the expensing decision. Future earnings represented by the firm's growth opportunities is significant and positive indicating that firms with more growth opportunities are less likely to expense option pay. More growth opportunities for the firm may result in greater usage of option pay, reserving cash for project funding rather than compensation. Cash flow shortage parameter estimate is insignificant. Although this result is contrary to expectations that firms opposing expensing are constrained from substituting cash compensation for option pay, perhaps the variable for growth is a proxy for cash constraint.

The results for variables that proxy for the cost of option compensation are generally as expected. The greater the portion of executive pay from options, the lower the probability of expensing option compensation. Using percent of options granted to the top five executives as a proxy for the broadness of option pay throughout the organization, the data shows the more concentrated options are to the executives (i.e., the fewer granted to non-executives) the more likely the firm will expense options. This result confirms the perception that opponents of option expensing grant more options to rank-and-file employees. The portfolio of unvested options for the executives does not influence the decision to expense. Since firms could choose when

Table 2.6 Logistic regression results

Logistic model of expensing stock option compensation (1) versus disclosing (0)				
Variable	Expected sign	Parameter estimate	Odds ratio	p-value
Intercept		-9.622		<0.0001
size	+	0.713	2.039	<0.0001
leverage	+	0.471	1.601	<0.0001
EPS	+	0.125	1.133	0.007
volatility	-	-0.0004	1.000	0.959
growth	+/-	1.628	5.092	<0.0001
option	-	-0.015	0.985	0.023
portfolio	-	-78.456	<0.0001	0.117
pcnt to top	+	0.014	1.014	0.052
CF shortage	-	-0.942	0.390	0.259
bonus	-	-0.019	0.981	0.091
newecon	-	-0.487	0.614	0.261
insider	+	0.029	1.029	<0.0001

they would begin expensing option pay, the impact of the unvested options could be reduced through the passage of time or by accelerated vesting as options become in-the-money.

Bonus compensation impacts the recognition decision, suggesting that as the portion of executive compensation from cash bonus increases, adopting an income-

reducing accounting practice is less likely. The new economy indicator variable is not significant, indicating that new economy firms are neither more nor less likely to expense option pay. However, the greater the portion of shares held by insiders, the greater the probability the firm will decide to expense options. Higher ownership by insiders in expensing firms can signal management's confidence about the firm's future earnings or can indicate less concern of job termination for lower reported earnings.

2.5 Discussion

The decision to expense stock option compensation ahead of a mandate by FASB can be explained through the theory of accounting choice. Consistent with efficient contracting theory, political exposure and leverage influence the decision to expense options. Since option expense unequivocally reduces reported earnings, the decision to expense options lowers political costs to the firm. Additionally, the accounting for option expense increases owners' equity on the balance sheet improving debt-equity ratios and reducing the potential for debt covenant violations.

The results from earnings management theory are mixed. While volatility of current earnings does not influence the decision to expense, the level of earnings and the use of options in the firm does. Firms choosing to expense options have greater earnings per share and use less option compensation in executive pay and throughout the firm.

The recognition decision also supports the information signaling theory of accounting choice. Firms use the expensing decision to reveal to the market their

expectations of greater future earnings. To the extent that greater insider ownership reveals management's knowledge of favorable prospects for the firm, expensing firms signal they are high quality firms by choosing to recognize option compensation.

CHAPTER 3

EXECUTIVE STOCK OPTION PAYOFFS

3.1 Signaling motive for option expensing

Accounting choice theory suggests firms select accounting methods and standard adoption timing to pursue efficient contracting, manage earnings, and signal private information. This essay focuses on the signaling implications of a firm's decision to expense option compensation prior to a mandate by FASB.

In the presence of information symmetry between managers and investors, investors are able to correctly distinguish between high quality and low quality firms. The market can then appropriately value firms based on the known quality. However, when information is asymmetric between managers and investors, the ability to correctly value a firm is impaired. Investors realize it is in the manager's best interest to present a favorable view of the firm's prospects. Unless management's talk is supported by actions, investors discount the information as hubris. To provide evidence of favorable prospects, managers must take actions that reveal their private information about the firm. These signals can be used to separate high quality firms from low quality firms. Interpreted correctly, the market utilizes the information to properly value the firm.

For a signal to be credible, it must meet two conditions. First, the signal must be costly but affordable to the signaling firm. Firms of higher quality are indicating their future prospects are sufficient to accommodate the cost imposed by the signal. The second condition is the signal must be cost prohibitive for low quality firms. Low quality firms cannot afford to implement the signaling action without excessive risk to the firm managers and owners. Because low quality firms are unable to mimic the signal by the better firms, the market is able to differentiate between the high and low quality firms.

Firms use signals in a variety of situations to indicate their superior quality. Research has shown decisions regarding debt maturity, capital structure, dividends, financing, and accounting standard adoptions reveal managers' private information about firm quality. These signaling devices provide a separating equilibrium, allowing investors to separately value high and low quality firms.

Diamond (1993) examines the signaling content of debt maturity. Borrowers of short-term debt are subject to more frequent and more detailed review of firm performance because the firm must refinance debt contracts at shorter intervals. Short-term debt also exposes a firm to more interest rate risk associated with refinancing. Accordingly, firms with better prospects use more short-term debt as a way to signal their financial strength. Weaker firms, on the other hand, are unwilling to subject themselves to the financial scrutiny and the interest rate risk associated with short-term debt.

The use of debt in a firm's capital structure also provides information about the quality of the firm. Contrary to the capital structure irrelevance theory by Miller and Modigliani (1961), the capital structure of the firm can provide information about firm quality which affects the value of the firm. Ross (1977) points out that Modigliani and Miller assume the market knows with certainty the stream of returns of the firm and uses that information to value the firm. However, the market only *perceives* the return stream and, therefore, changes in the market's perception can change the value of the firm. The use of debt in a firm's capital structure can alter the perception of expected cash flow. Because debt obligates the firm to future cash outflows for debt service, high levels of debt suggest management anticipates favorable earnings prospects. Ross shows that when compensation depends on current and future value of the firm, managers will choose to use more debt in its capital structure to influence the market's perception of future cash flows. Additional evidence of the use of debt as a signaling device is presented by Noe (1988) who shows that low quality firms choose less debt in their capital structure to reduce the associated costs of bankruptcy.

The choice of financing also is a way managers can reveal private information. The use of debt financing is viewed as a signal that managers believe the firm's equity is undervalued. Additionally, debt financing increases the firm's commitment to cash outflows for debt service. Therefore, only firms expecting favorable earnings prospects can afford to use debt to fund projects (Ravid and Sarig, 1991). Because the debt is expensive, investors interpret the debt financing decision as an indication of a high value project (Blazenko, 1987; Narayanan, 1988).

Similarly, dividend policy commits the firm to cash outflows to sustain dividend payout. Firms are able to obligate themselves to a chosen dividend policy only if they expect sustained earnings to support the dividend (Bhattacharya, 1979; Easterbrook, 1984; John and Williams, 1985; Ravid and Sarig, 1991). The cost of signaling with dividends is prohibitively high for firms with lower earnings; thus, dividend policy allows investors to distinguish firm quality (Miller and Rock, 1985; Healy and Palepu, 1993).

The decision on how and when to implement an accounting policy also reveals inside information to the market. Firms with more favorable prospects select an implementation strategy that signals their financial strength. Early implementation of a new accounting standard is indicative of a high quality firm, whereas, delayed adoption reveals less favorable information about the firm (Amir and Ziv, 1997b). Firms that delay adoption until the mandatory implementation date use the time to renegotiate underlying contracts to reduce negative impacts of the regulation (Amir and Ziv, 1997a). When Staff Accounting Bulletin 51 was issued, firms could choose to take gain from an equity carve-out into the balance sheet or the income statement. Financially strong firms elected to take the gain on the income statement, signaling their expectation of higher future profitability (Hand and Skantz, 1998).

The decision on implementation of policy can also be used to correct investors' perceptions about the policy's effect on the firm. If insiders believe investors have incorrectly assessed the impact of the policy, early implementation of the policy can clarify the misperception. Such a situation existed when SFAS 106 (Employers'

Accounting for Post-Retirement Benefits other than Pensions) was promulgated by FASB in 1990. Firms elected early adoption of the standard when the investors' consensus of the firm's liability was greater than the actual liability. Thus, firms use adoption timing as a means to clarify the impact of the standard (Amir and Livnat, 1996).

Often times the decision to voluntarily implement an anticipated accounting standard or governmental regulation is used by firms with high compliance costs to secure more lenient treatment should the policy be implemented in the future (Heyes, 2005). Firms with high compliance costs use voluntary implementation to demonstrate that although they have greater compliance costs, they expect favorable future earnings to cover the increased costs and favorable treatment by the regulatory body.

The decision to expense stock options unambiguously reduces reported income, making it an expensive decision for the firm. According to signaling theory, only high quality firms are able to effectively implement a costly choice to reveal private information. Therefore, if the decision to voluntarily expense stock option compensation is used to signal firm quality, then firms that elect to expense options should be high quality firms. Assessment of firm quality can be made by examining the effectiveness of the firm's stock option compensation program. Effective stock option plans should generate improved firm performance as well as provide adequate incentives to maintain alignment of management and shareholders' interests. Accordingly, this research examines the payoff from option grants to the firm and to the pay-performance sensitivity of CEO option compensation for expensing and non-

expensing corporations. If expensing firms use the option recognition decision to signal they are high quality firms, then the payoffs from option compensation should be greater for expensing firms. Additionally, the recognition decision signals the firm's stock option compensation better aligns CEO and shareholder interests.

3.1.1 Option grants and firm performance hypothesis

Research has shown that, generally, firm performance is positively related to option compensation. Hall and Liebman (1998) examine firm performance and compensation for CEOs in large, publicly traded U.S. firms during the period from 1980 to 1994 and find a positive relation between the change in firm value and the change in CEO wealth. Most of the change in CEO wealth is driven by the change in stock and stock option values. Similar findings are presented by Perry and Zenner (2001) and Kedia and Mozumdar (2002). Perry and Zenner examine compensation changes subsequent to the 1993 enactment of Section 162(m) of the Internal Revenue Code, limiting deductibility of nonperformance-based compensation of the firm's top five compensated executives to $1 million each. The positive relation between stock returns and total compensation for firms paying executive salaries at or above $1 million strengthened after 1993.

Using stock returns as a measure of the effectiveness of stock option grants has inherent problems. First, given that markets are efficient, the anticipated benefits of a firm's stock option compensation plan are already incorporated into the stock price. DeFusco et al. (1990) use an event study to examine the returns to stock when firms change their stock option compensation plan. During the period between board

approval of changes to the stock option plan and Security and Exchange Commission receipt of the firm's proxy, firms realize an excess return of 4%. Thus, the anticipated effects of the stock option plan are incorporated into the stock price. Second, there is a mechanical relation between stock return and stock option value since stock price and dividend yield are used to calculate the value of the stock option. Using stock return as a measure of firm performance leads to a circular relation with option grant value. Consequently, empiricists often use accounting measures of performance that are correlated with stock return.

A variety of accounting measures are used to assess firm performance. Mehran (1995) uses both Tobin's Q and return on assets, citing the high correlation of these measures with stock return. He finds a positive relation between both measures of performance and executive equity compensation. Similarly, Kedia and Mozumdar (2002) find firm performance, measured as growth in sales, net income, or operating income, increases as the quantity of options outstanding increase.

Firm value is impacted by the cash flows generated by the firm. If stock option compensation motivates managers to increase operating income which, in turn, increase firm value, then operating income is an appropriate measure of performance. Hanlon et al. (2003) evaluate whether the value of new option grants to the firm's top five executives are associated with future operating income. Recognizing the entire portfolio of option grants provide incentive to the executive, Hanlon et al. include current year and prior years' option grants as determinants of firm performance. They find a positive but diminishing return to operating income from executive stock option grants.

If firms use voluntary option recognition to indicate the effectiveness of option grants on firm performance, then firms that choose to expense stock option pay should realize greater firm performance from their option grants. Using operating income as a measure of firm performance from option grants, the hypothesis under consideration is:

1. Firms that voluntarily recognize option compensation have a stronger relation between option grants and firm performance than firms that do not volunteer to recognize option expense.

3.1.2 Pay-performance sensitivity of CEO option grant hypothesis

The incentive value of stock option grants for CEOs is typically measured as pay-performance sensitivity of the change in value of the option grant relative to a change in value of the firm or of CEO wealth. An effective stock option plan provides appropriate incentive value from the option grant to motivate recipients to act in the best interest of the shareholders.

Determinants of the incentive value of option grants include firm size, leverage, growth opportunities, CEO stock ownership, and relative noise in measures of performance. A key question is whether the incentive value of options in expensing firms relative to non-expensing firms are due to differences in these determinants. If expensing firms are high quality firms, then the incentives from options should better align interests of shareholders and managers in expensing firms than in non-expensing firms.

Large firms are typically complex and require skilled managers who are highly compensated. Moreover, monitoring managerial actions is more difficult in large firms.

To intensify interest alignment with shareholders, managers of large firms earn greater payoffs from option grants (Baker and Hall, 1998; Core and Guay, 1999).

Highly levered firms use less equity-based compensation to lower debt premiums demanded by debt-holders to compensate for risk-shifting between creditors and shareholders (John and John, 1993). Consequently, incentive payoffs decrease as firm leverage increases to mitigate debt-holders' concerns (John and John, 1993; Bryan et al., 2000).

Although debt holders want to curb managerial decisions that transfer risk from shareholders to debt-holders, shareholders want managers to take the appropriate level of risk to maximize firm value. From the shareholders' perspectives, stock options provide an incentive to increase risk-taking behavior since the value of the managers' stock options increase as stock volatility increases.[7] As such, options provide an incentive for managers to implement risky positive net present value projects and to focus on long-term firm performance. The firm's growth opportunities include the portfolio of projects available to the firm. Since shareholders have limited visibility of the scope of the these projects, incentives provide an opportunity to motivate managers to make appropriate decisions regarding this portfolio of investments. A strong link between the firm's portfolio of positive NPV investment opportunities and managerial incentives motivates managers to make value-maximizing decisions. Evidence of a positive association between pay sensitivities and the firm's growth opportunities is

[7] While stock options increase in value as risk of the firm increases (as measured by return volatility), managers with a large portion of their financial wealth and human capital invested in the firm have an incentive to reduce risk to offset their undiversified portfolio.

supported by Lewellen et al. (1987), Smith and Watts (1992), Gaver and Gaver (1995), Core and Guay (1999) and Bryan et al. (2000). Contrary to expectations, Bizjac et al. (1993) and Yermack (1995) find firms with more growth opportunities have lower incentive sensitivities for their CEOs.[8]

Performance measures used to evaluate and reward managers can be 'noisy'; that is, the measures do not provide a clear depiction of outcomes resulting from managerial actions. When performance measures used to evaluate management decisions contain noise that obscures the ability to associate managerial actions and firm value, the risk imposed by the performance measure increases. The greater the risk borne by the manager, the larger the premium required to compensate for the additional exposure (Feltham and Xie, 1994). To determine the appropriate measure of firm performance, the signal-to-noise property of the measure is considered. If an accounting performance measure provides a better indicator of managerial decisions, then incentives based on this measure provide better motivation. If these measures do not clearly represent the outcomes of managerial actions, market measures may be preferred. Earnings-based performance measures assess the results of current and past managerial decisions, while market-based measures incorporate expectations of future managerial changes. Earnings-based measures can be noisy due to the time lag between managerial actions and impact the actions have on reported earnings. The noise in

[8] Yermack (1995) explains that his choice of dependent variable, the sensitivity of CEO wealth to change in firm value, is different than measures of incentive intensity used in previous research. Bizjak et al. (1993) uses a similar measure of pay sensitivity, sensitivity of total CEO compensation (cash and equity-based) to stock price performance, and find the incentive sensitivity is lower in high growth firms. The time period under investigation in their research is 1975 to 1989, a period when cash compensation was a substantial portion of the executives' compensation package. As such, executives may have had an incentive to conserve cash to pay salaries and bonuses rather than invest in risky projects.

market measures reflects changing expectations of future firm performance (Engel et al., 2003). To be effective, CEO compensation should be tied more closely to the variable with greater signal-to-noise ratio (Lambert and Larcker, 1987). As the noise in earnings increases relative to the noise in stock returns, the use of stock-based performance measures are better incentive alignment tools. Bryan et al. (2000) and Yermack (1995) use relative measures of earnings variance to return variance and find when accounting measures are noisy relative to stock return, the incentive sensitivity of option compensation increases. Yermack (1995) finds firms with greater noise in their accounting performance measures than in their market measures, use more stock options. Further support of this relationship is offered by Eaton and Rosen (1983) and Lewellen et al. (1987).

Stock option compensation and stock ownership provide incentives for executives to increase firm performance. However, as the executive's ownership level increases, additional equity ownership does not result in increased profitability. If the equity portfolio held by the executives is close to the profit-maximizing level, then an increase in equity incentives would not translate into increased profitability (Abowd and Kaplan, 1999). This result is borne out in subsequent research showing the incentive intensity of option compensation is inversely related to share ownership (Mehran, 1995, Bryan et al., 2000). As the level of ownership in the firm increases, managerial and shareholder interests are more closely aligned, so the incentive value of additional stock options is diminished. Additionally, as the manager's portfolio becomes more heavily invested in the firm, new option grants serve to increase the risks of being undiversified.

Yermack (1995) finds the relation between stock ownership and incentive sensitivity is insignificant and suggests that CEOs adjust their existing portfolio to offset additional exposure that results from stock option holdings.

If the incentive alignment of stock option program in expensing firms is more effective than in non-expensing firms, then the contribution of each of these determinants should enhance alignment of CEO and shareholder interests. Using previously identified determinants of pay-performance sensitivity of stock option grants, the hypothesis is:

2. Stock option compensation to the CEO better aligns shareholders' and manager's interests in expensing firms than in non-expensing firms.

3.2 Option grants and firm performance

3.2.1 Measurement of theoretical variables

The model measuring payoff of option grants on firm performance is the model used by Hanlon et al. (2003). The objective of the model is to determine the extent to which incentives provided to management via stock option compensation is evidenced in the firm's operating income.

The following model will be used to analyze the full data set, the set of expensing firms, and the set of non-expensing firms.

$$(OI/S)_{i,t} = \beta_0 + \beta_1(TA/S)_{i,t-1} + \sum_{k=0}^{5}\beta_{2,k}(ESO/S)_{i,t-k} + \sum_{k=0}^{5}\beta_{3,k}(ESO/S)^2_{i,t-k} + \sum_{k=0}^{5}\beta_{4,k}(RD/S)_{i,t-k} + \beta_5(volois)_{i,t-1} + \beta_6(\text{Industry dummies}) + \beta_7(\text{Year dummies}) + \mu_{i,t}$$

where:

OI/S = operating income before depreciation and research and development costs scaled by sales;

TA/S = total assets scaled by sales;

ESO/S = sum of the option grants for the firm's top 5 executives, scaled by sales;

RD/S = research and development expense scaled by sales;

volois = standard deviation of previous 5 years of OI/S;

The effect of firm size on operating income is controlled by including the ratio of total assets scaled by sales. Firms with a larger asset-base are expected to generate greater operating profit. Option grants for current year and prior 5 years are included to measure the effect of the executives' outstanding stock options. Aboody et al. (2004a) find the average life of executive stock options is just over 5.5 years. Hence, a 5-year lag of option grants is included in the model. The second-order term for option grants is of particular interest in the model. Forming portfolios of option grants based on size, Hanlon et al. (2003) find a concave relationship between operating income and stock option grants, suggesting operating income increases with option grants at a decreasing rate. To model this effect, Hanlon et al. include the second order term and examine the sum of the coefficients on the second-order term. Their results confirm the relation between option compensation and operating income exhibits diminishing returns.[9]

[9] Larcker (2003) observes the results in Hanlon et al. (2003) research show the sum of the coefficients on the current and lagged stock option grants is negative and significant in their linear model (i.e., when second order terms for stock options are excluded from the model), implying grants degradate firm

Research and development expenses are included to control for the effect that growth opportunities of the firm have on operating income. Finally, the model controls for risk, industry, and year.

The regression is performed on the full set of firms, the expensing set, and the non-expensing set to determine if payoffs from option grants differ between the expensing and non-expensing set of firms. Of particular interest is the diminishing returns to firm performance from stock option compensation. Diminishing operating income from option grants may indicate the firm is granting options in excess of the optimal level, providing no additional benefit to the firm. If high quality firms use stock option compensation effectively, then the quantity of grants should improve, not diminish, firm performance.

3.2.2 Data and descriptive statistics

The data set of expensing and non-expensing firms are as described in Chapter 2 and consists of 40 expensing firms and 545 non-expensing firms. The model is estimated using nine years of compensation data (1993 – 2001) obtained from ExecuComp database. ExecuComp provides information reported in the firm's proxy statement. This information includes compensation data for the firm's top five executives. Firm data is from Compustat and is merged with the ExecuComp data. After eliminating observations with missing variables, the data set includes 1776 firm-

---

performance. However, when the second order terms are included in the model, the sum of the coefficient for the first order option variables becomes positive and significant, signifying an improvement in performance from option grants. Larcker questions if the change in sign results from model misspecification or omitted variable problem. Employing a model regressing future operating performance on stock option grants, Larcker finds a significant positive relation between stock option grants and future operating income – a result that is in contrast to the findings of the linear model proposed by Hanlon et al.

year observations of which 1651 are for non-expensing firms and 125 are for expensing firms.[10] Payoff regression uses stock option grant information for the current year and prior 5 years. Accordingly, the regression data covers operating income for the period 1998 – 2001, with option compensation for the period 1993 – 2001.

Research and development cost is not reported by Compustat for 630 of the firm-year observations (586 firm-year observations for non-expensing firms and 44 for expensing firms). Missing R&D values are set to zero. Plots of the data show outliers for many variables; therefore, to control for outliers, variables used in the model are reset at the 1% and 99% levels.

To determine if the quadratic terms for current and lagged stock option compensation should be included in the model, the relation between operating income scaled by sales (OI/S) and stock option compensation scaled by sales (ESO/S) is analyzed. The data are ranked in order of current year ESO/S and then placed into 25 portfolios based on rank order. The mean value of current year ESO/S and OI/S are calculated for each portfolio. Figure 3.1a contains a plot of mean ESO/S against mean OI/S for the portfolios. Figure 3.1b considers the relation of mean of the sum of current year and lagged years ESO/S to OI/S for portfolios formed on rank order of the sum of current and lagged ESO/S. The results indicate a curvilinear relation between operating income and option compensation, validating the inclusion of the quadratic ESO/S terms.

[10] Expensing firms in the data set were reduced from an initial 59 firms to 40 firms due to missing stock option compensation data. The set of non-expensing firms was reduced from 1084 to 545 due to a variety of missing data.

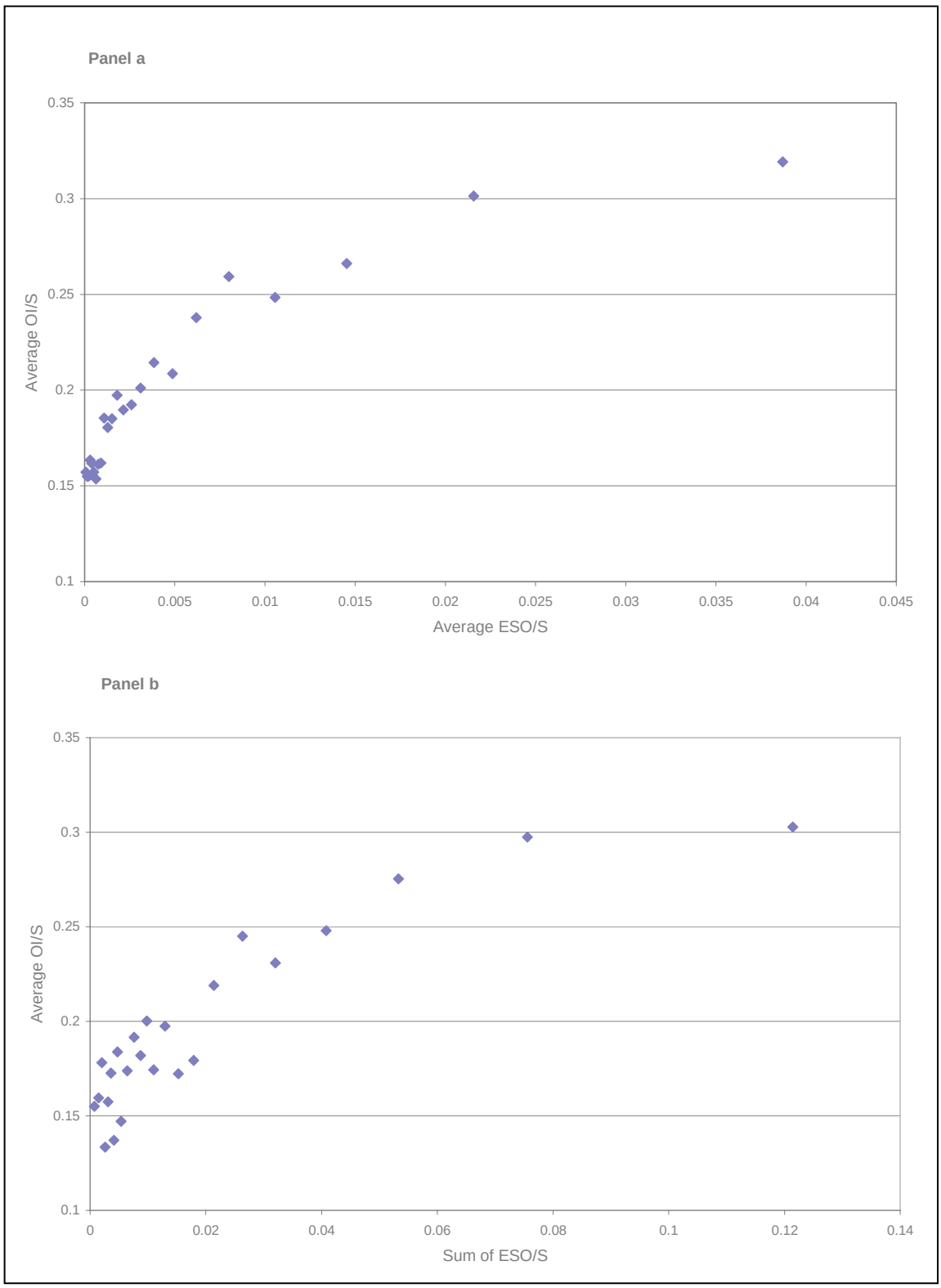

Figure 3.1 Operating income relative to option grants for all firms

Figures 3.2 and 3.3 show the relation between OI/S and ESO/S for non-expensing firms and expensing firms, respectively. For non-expensing firms, the relation also appears curvilinear suggesting inclusion of the quadratic ESO/S terms. However, for the expensing firms, it is not as clear as to the need for the quadratic ESO/S terms. For comparison purposes, however, the model for the expensing firms will include the quadratic terms and test to see if the sum of the coefficients is significantly different from zero.

Table 3.1 examines the difference in means for the variables under consideration. Expensing firms are considerably larger than non-expensing firms as measured by either operating income or sales. The value of the stock option grants awarded is also larger for expensing firms, which is expected, given that large firms generally compensate executives at a higher rate (Murphy, 1999). However, after scaling option grant value by sales, the mean of option compensation is 8 times greater for non-expensing firms. Table 3.2 shows the results for the Wilcoxon rank sums test of difference in medians of the variables. Generally, the relations between the medians of the two sets of firms are the same as for the means. Although the median value of scaled option compensation is still greater for non-expensing firms, it is only twice that of the expensing firms.

Correlations between the variables are shown in Table 3.3. The Pearson correlation calculates the correlation between variables assuming the variables are from populations that are normally distributed. Pearson correlation coefficients are shown in

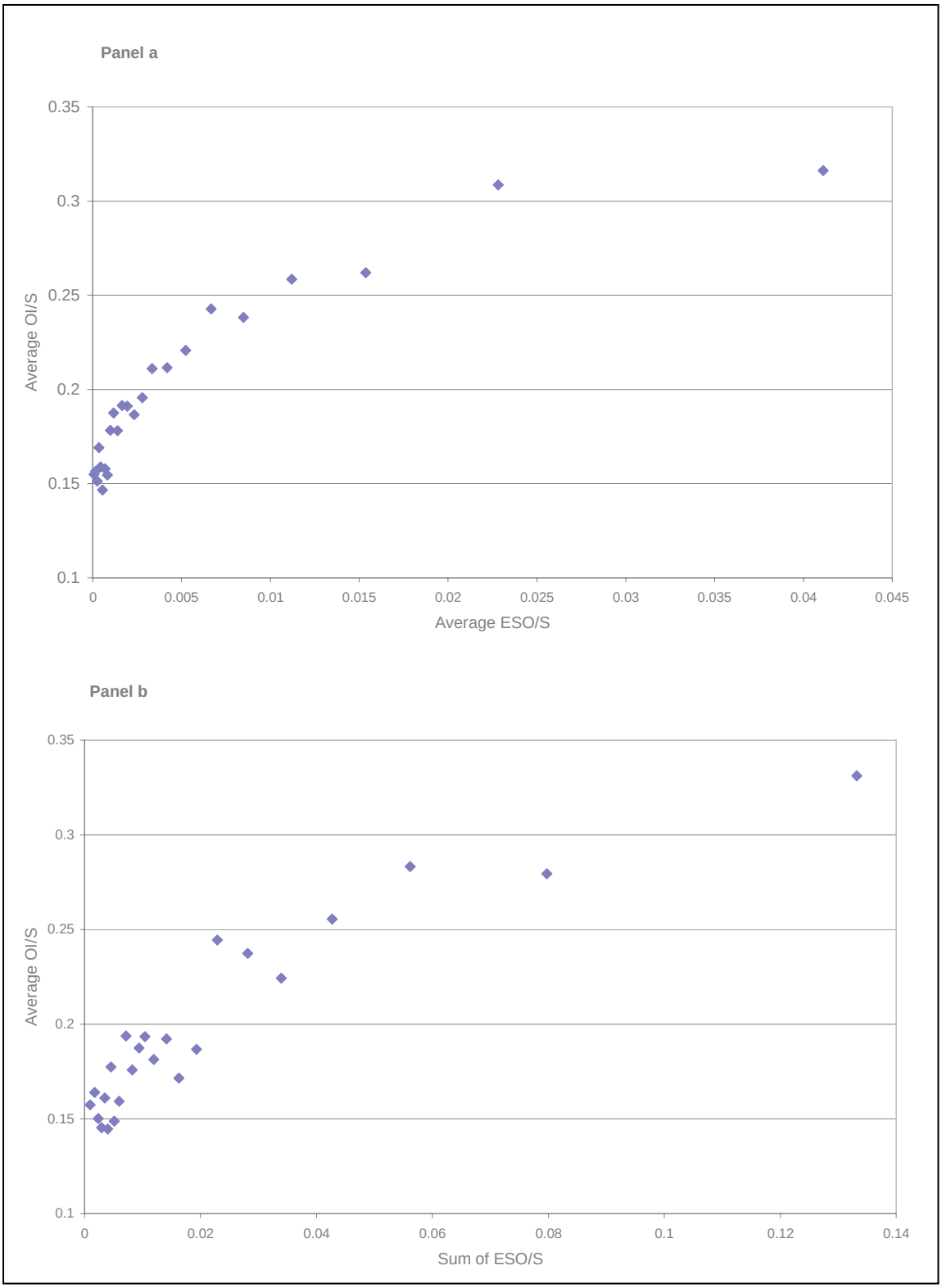

Figure 3.2 Operating income relative to option grants for non-expensing firms

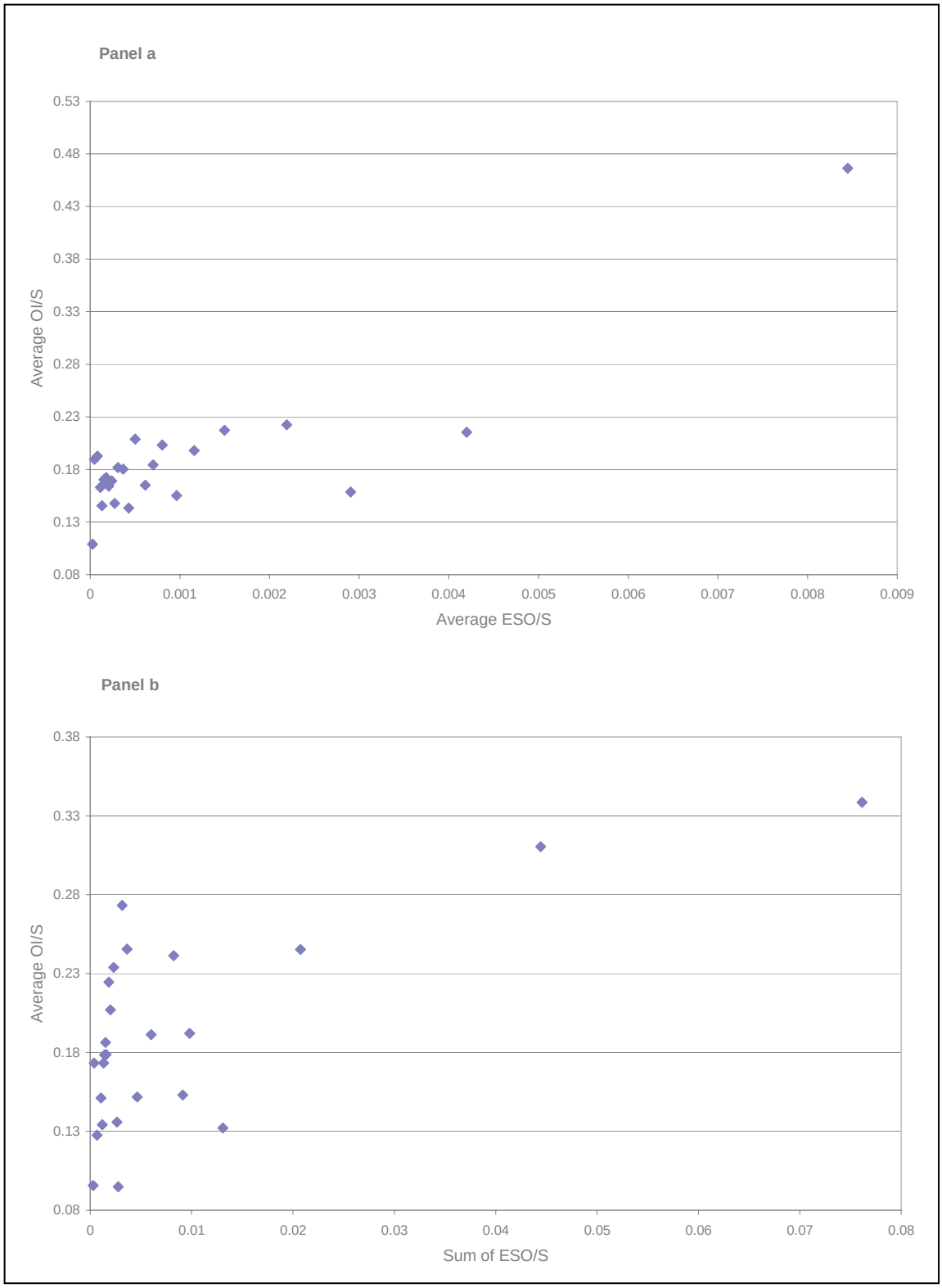

Figure 3.3 Operating income relative to option grants for expensing firms

Table 3.1 Mean values and difference in means analysis

	All firms		Non-expensing firms		Expensing firms		Exp vs. non-exp
Variables	Mean	Std dev	Mean	Std dev	Mean	Std dev	p-value
OI ($b)	1.060	3.046	0.766	1.714	4.939	8.796	<0.0001
Sales ($b)	6.467	16.923	4.720	8.623	29.542	50.328	<0.0001
ESO ($m)	9.834	23.259	9.724	23.699	11.290	16.375	0.160
OI/S	0.198	0.141	0.199	0.142	0.190	0.129	0.241
TA/S	1.858	16.831	1.890	17.454	1.442	1.113	0.155
ESO/S	0.007	0.020	0.008	0.020	0.001	0.003	<0.0001
RD/S	0.054	0.156	0.057	0.161	0.017	0.033	<0.0001

Table 3.2 Median values and difference in median analysis

Variables	All firms Median	Non-expensing Median	Expensing Median	Exp vs. non-exp p-value
OI ($b)	0.262	0.238	1.008	<0.0001
Sales ($b)	1.762	1.618	7.748	<0.0001
ESO ($m)	3.618	3.579	4.435	0.164
OI/S	0.173	0.173	0.161	0.516
TA/S	0.991	0.989	1.052	0.516
ESO/S	0.002	0.002	0.001	<0.0001
RD/S	0.004	0.004	0.0001	0.078

the upper triangles of the table. Spearman correlation is a nonparametric method that is based on the ranking of the variables, requiring no assumption about the distribution of the values. Coefficients in the lower triangles are the Spearman correlation coefficients. For the set of all firms, the Pearson correlation coefficients show strong correlation between operating income and total assets, whereas the Spearman correlation coefficients show a strong relation between R&D and option grants. Examining the correlation coefficients for the non-expensing and expensing sets of firms, there are some notable differences. The Pearson correlation coefficient between operating income and total assets is negative for the non-expensing firms and positive for the expensing firms. However, the sign of the correlation coefficient for these variables is the same for expensing and non-expensing firms in the Spearman data. The Pearson

Table 3.3 Correlation coefficients – option payoff variables

	All firms				Non expensing				Expensing			
Variable	OI/S	TA/S	ESO/S	RD/S	OI/S	TA/S	ESO/S	RD/S	OI/S	TA/S	ESO/S	RD/S
OI/S	1.000	-0.069	0.110	0.154	1.000	-0.074	0.109	0.152	1.000	0.518	0.386	0.408
TA/S	0.617	1.000	0.269	0.323	0.607	1.000	0.269	0.323	0.758	1.000	0.366	0.152
ESO/S	0.336	0.266	1.000	0.746	0.346	0.284	1.000	0.746	0.251	0.237	1.000	0.186
RD/S	0.404	0.289	0.374	1.000	0.409	0.295	0.404	1.000	0.336	0.266	-0.149	1.000

coefficients show a much stronger relation between operating income and option grants for expensing firms than for non-expensing firms. The Spearman coefficients for these variables are similar for the sets of firms. The Pearson correlation between R&D and option compensation is positive for both expensing and non-expensing firms but much stronger for non-expensing firms. For the same variables, the Spearman coefficients show a positive relation for non-expensing firms and a negative relation for expensing firms.

3.2.3 Regression results

The regression model is analyzed using the full set of firms as well as the expensing and non-expensing set of firms. The model using the full set of firms is performed to compare the results with those of Hanlon et al. (2003). Separate regressions for each set of firms are performed to determine if the relation between option grants and firm performance is different for expensing and non-expensing firms. If expensing firms use the decision to voluntarily expense stock option compensation to signal superior quality, then the payoff for the firm should be greater for expensing firms. The regression results for the full set of firms are provided in Table 3.4.

For the full set of firms, the results are similar to those of Hanlon et al. (2003). Model 1 considers only the linear component of the payoff function. The sum of the coefficients for the current and lagged option grants is negative and significantly different from zero. This suggests stock option grants result in lower operating income. This unexpected result may be due to model misspecification. Recall the relation between ESO/S and OI/S presented in Figure 3.1 suggest the model with quadratic

Table 3.4 Regression results – all firms

	Model 1		Model 2		Model 3		Model 4	
Variable	Coeff	t-stat	Coeff	t-stat	IV Coeff	t-stat	IV Coeff	t-stat
Intercept	0.071	(1.69)	0.064	(1.60)	0.120	(23.56)	0.058	(2.06)
TASl	0.058	(13.40)	0.057	(13.75)	0.065	(17.04)	0.065	(17.89)
ESOS	0.242	(0.84)	2.600	(3.96)	-0.190	(-0.72)	-0.159	(-0.63)
ESOSl1	-0.645	(-2.39)	1.803	(2.84)	-0.769	(-2.69)	2.640	(4.12)
ESOSl2	0.025	(0.09)	1.513	(2.39)	0.510	(1.54)	2.289	(2.88)
ESOSl3	-0.676	(-2.13)	0.731	(1.11)	-0.032	(-0.08)	1.302	(1.55)
ESOSl4	-0.399	(-1.34)	-0.436	(-0.65)	-0.477	(-1.32)	1.163	(1.45)
ESOSl5	0.519	(1.76)	-0.240	(-0.38)	0.041	(0.13)	-0.362	(-0.53)
ESOSsq			-20.587	(-4.43)			1.323	(1.36)
ESOSl1sq			-18.956	(-5.00)			-26.619	(-6.68)
ESOSl2sq			-9.974	(-2.86)			-18.368	(-3.21)
ESOSl3sq			-4.986	(-1.43)			-10.613	(-1.55)
ESOSl4sq			-2.316	(-0.58)			-23.282	(-3.64)
ESOSl5sq			-3.541	(0.84)			2.934	(0.61)
voloisl1	-0.018	(-6.17)	-0.013	(-4.61)	-0.019	(-6.24)	-0.014	(-4.64)
∑β (RDS)	0.149	F = 13.82 p=0.002	0.149	F = 15.30 p <0.0001	0.142	F = 13.36 p = 0.0003	0.191	F = 26.27 p < 0.0001
Adj R-sq		0.259		0.330		0.204		0.288
Adj R-sq – no dummies		0.209		0.290				
∑β(ESOS)	-0.934	F = 9.23 p = 0.0024	5.971	F = 83.06 p < 0.0001	-0.917	F = 7.37 p = 0.007	6.873	F = 100.57 p < 0.0001
∑β(ESOSsq)			-60.360	F = 125.71 p < 0.0001			-74.625	F = 143.06 p < 0.0001

ESO/S terms is more appropriate. Model 2 includes the linear and quadratic terms. In this model the sum of the ESO/S coefficients are significantly positive and the sum of

the coefficients of the quadratic terms is significantly negative, suggesting that while there is a positive relation between stock option pay and operating income, the payoff is increasing at a decreasing rate.

Table 3.5 shows results for the regression for non-expensing firms only. As with the full set of firms, the sum of the coefficients for option grants is significantly negative in the linear model (Model 5) and significantly positive when the quadratic terms are introduced (Model 6). The results for the expensing firms are found in Table 3.6. For the linear model (Model 9), the sum of the coefficients for stock option grants is positive and significant. When the quadratic terms are introduced (Model 10), the sum of the coefficient on the linear terms continues to be positive and significant, while the sum of the coefficients on the quadratic terms is not statistically different from zero. The lack of diminishing return to operating income supports the findings in Figure 3.3, in which curvature is not clearly visible. More interesting is that stock option grants provide greater returns to operating income for expensing firms than for non-expensing firms. This supports the hypothesis that the relation between stock option compensation and performance is stronger for expensing firms than for non-expensing firms.

Current year stock option grants are included in the model because information about when current year options are issued is unknown. If the stock options are issued prior to the end of the fiscal year, then they could contribute to firm performance. However, because shocks to the firms operating income could also affect the value of the current year option compensation, an instrumental variable is used to eliminate

Table 3.5 Regression results – non-expensing firms

	Model 5		Model 6		Model 7		Model 8	
Variable	Coeff	t-stat	Coeff	t-stat	IV Coeff	t-stat	IV Coeff	t-stat
Intercept	0.071	(1.29)	0.061	(1.17)	0.120	(22.38)	0.048	(1.44)
TASl	0.061	(12.86)	0.059	(13.14)	0.067	(16.17)	0.067	(17.02)
ESOS	0.250	(0.86)	2.417	(3.63)	-0.199	(-0.74)	-0.168	(-0.66)
ESOSl1	-0.636	(-2.33)	1.915	(2.98)	-0.773	(-2.67)	2.581	(3.96)
ESOSl2	0.011	(0.04)	1.924	(2.97)	0.515	(1.54)	2.834	(3.48)
ESOSl3	-0.648	(-2.02)	0.756	(1.13)	-0.134	(-0.03)	1.202	(1.40)
ESOSl4	-0.350	(-1.16)	-0.596	(-0.89)	-0.448	(-1.23)	0.871	(1.07)
ESOSl5	0.513	(1.72)	-0.274	(-0.43)	0.029	(0.09)	-0.386	(-0.56)
ESOSsq			-19.107	(-4.06)			1.630	(1.420)
ESOSl1sq			-19.623	(-5.11)			-26.228	(-6.47)
ESOSl2sq			-12.512	(-3.51)			-22.335	(-3.82)
ESOSl3sq			-4.740	(-1.34)			-9.205	(-1.31)
ESOSl4sq			-0.885	(-0.22)			-20.437	(-3.16)
ESOSl5sq			3.832	(0.90)			3.055	(0.63)
voloisl1	-0.019	(-6.22)	-0.014	(-4.79)	-0.020	(-6.31)	-0.014	(-4.82)
∑β (RDS)	0.122 F = 8.77 p = 0.003		0.117 F =8.98 p = 0.003		0.125 F = 10.10 p = 0.002		0.168 F = 19.46 p < 0.0001	
Adj R-sq	0.256		0.333		0.202		0.289	
Adj R-sq – no dummies	0.207		0.291					
∑β (ESOS)	-0.860 F = 7.53 p = 0.006		6.142 F = 84.37 p < 0.0001		-1.010 F = 6.69 p = 0.010		6.934 F = 97.39 p < 0.0001	
∑β(ESOSsq)			-53.035 F =120.88 p < 0.0001				-73.520 F =132.25 p < 0.0001	

correlation between the error term and regressors. Hanlon et al. (2003) use the fitted value of ESO/S obtained by regressing the firm's ESO/S on the industry average of

Table 3.6 Regression results – expensing firms

	Model 9		Model 10		Model 11		Model 12	
Variable	Coeff	t-stat	Coeff	(t-stat)	IV Coeff	t-stat	IV Coeff	t-stat
Intercept	0.137	(2.69)	0.109	(2.10)	0.073	(5.22)	0.080	(1.99)
TASl	0.024	(2.42)	0.030	(2.87)	0.043	(4.93)	0.045	(4.94)
ESOS	6.003	(1.51)	21.710	(1.46)	5.775	(1.390)	-3.429	(-0.50)
ESOSl1	10.509	(2.43)	10.450	(0.71)	7.691	(1.67)	2.916	(0.18)
ESOSl2	-12.36	(-4.27)	2.832	(0.20)	-8.114	(-2.65)	5.769	(0.38)
ESOSl3	0.046	(0.02)	10.120	(0.78)	-1.826	(-0.61)	15.358	(1.14)
ESOSl4	9.683	(0.84)	-14.562	(-0.77)	7.892	(0.65)	6.731	(0.33)
ESOSl5	-4.448	(-0.49)	0.318	(0.02)	-4.218	(-0.46)	-1.120	(-0.06)
ESOSsq			-1017.800	(-1.89)			-0.531	(-0.38)
ESOSl1sq			-678.954	(-1.15)			-174.626	(-0.27)
ESOSl2sq			-555.906	(-1.10)			-526.361	(-0.98)
ESOSl3sq			-349.591	(-0.94)			-566.451	(-1.47)
ESOSl4sq			4515.742	(1.44)			1661.971	(0.49)
ESOSl5sq			-2134.122	(-1.03)			-1218.459	(-0.55)
voloisl1	2.074	(4.66)	1.393	(2.56)	1.640	(4.22)	1.159	(2.39)
∑β (RDS)	0.646	F = 3.90 p = 0.051	1.01	F = 7.51 p = 0.007	0.638	F = 3.71 p = 0.057	0.925	F = 6.19 p = 0.014
Adj R-sq		0.651		0.658		0.555		0.546
Adj R-sq- no dummies		0.555		0.556				
∑β (ESOS)	9.435	F =5.63 p = 0.020	30.868	F = 5.50 p = 0.021	7.200	F = 3.20 p = 0.077	26.225	F = 3.85 p = 0.053
∑β(ESOSsq)			-220.631	F = 0.05 p = 0.819			-824.457	F = 0.64 p = 0.426

ESO/S (excluding the firm-year observation). Accordingly, the instrument for ESO/S in the model is found by obtaining the predicted ESO/S from the following regression.

$$ESO/S_{it} = \delta_0 + \delta_1(\text{Industry average of ESO/S excluding firm-year } it)_{it} + \upsilon_{it}$$

A Durbin-Wu-Hausman (DWH) test for endogeneity was performed to determine if the instrumental variable is actually needed. The test is performed by obtaining the residuals from the above model and testing the statistical significance of the parameter estimate on the residuals in the following regression model.

$$OI/S_{it} = \theta_0 + \theta_1 TA/S_{it-1} + \theta_2 ESO/S_{it} + \theta_3 RD/S_{it} + \theta_4 volois_{it} + \theta_5(\text{IV resid})_{it} + \varepsilon_{it}$$

If the parameter estimate on the IV residual term is statistically different from zero, then the estimate on ESO/S_{it} in the original model is inconsistent, indicating an instrumental approach is appropriate. The results of the DWH test indicate the parameter estimate for ESO/S in the standard OLS model is inconsistent; therefore, using an IV approach in the model is required.

The results from the regression models using the instrumental variable for ESO/S for the full firm dataset, the non-expensing data set, and the expensing data set are found in the last two columns in Tables 3.4 – 3.6. In the IV models, the industry and year indicator variables are excluded since the instrument is estimated on an industry-year basis. The tests on the sum of the parameter estimates for the linear terms and quadratic terms are qualitatively similar to the results from the standard OLS model. Again, the models show that pay-offs from stock option grants show diminishing returns for non-expensing firms while the pay-off for expensing firms is positive and linear.

To test whether the model coefficients are the same across the regression models for expensing and non-expensing firms, a Chow test was performed. The Chow

test results from the regression models using instrumental variables for ESO/S terms, find that the coefficients across the sets of firms are different in the models with and without the quadratic terms. Therefore, the pay-off from option grants is different for expensing firms and non-expensing firms.

3.2.4 Discussion

The hypothesis considers that expensing firms use their decision to expense stock options prior to a mandate by FASB as a signal of their superior quality. High quality firms will use option compensation to affect firm performance. The Hanlon et al. (2003) model is used to compare pay-offs from option grants for expensing and non-expensing firms. Regression results support the findings of Hanlon et al. for the full set of firms. For the full set of firms, there are diminishing returns to operating income from stock option grants to the firm's top five executives. This result holds for non-expensing firms also. However, for expensing firms, the model shows a positive and increasing returns to operating income from option compensation. The difference between expensing and non-expensing firms suggests that expensing firms realize increasing payoff from grants while non-expensing firms see diminishing payoffs. Thus, the decision to expense option pay is an indicator of superior firm quality as measured by the effective use of option grants.

Non-expensing firms may choose to postpone expensing until mandated by FASB in order to renegotiate underlying contracts. If option grants for non-expensing firms are excessive, then the time until expensing is required provides these firms the opportunity to examine their option compensation program to improve the relation

between grant levels and firm performance. There is evidence that firms are adjusting compensation contracts prior to the June 2005 mandate to expense option pay. On July 3, 2003, *The Wall Street Journal* reported the results of a survey by Mercer Human Resource Consultants of 33 large U.S. firms. Seventy-five percent of the surveyed firms said they plan to make changes to their stock option and other long-term incentive programs. More than half of these firms indicated they would reduce the number of stock options granted. Employees below the middle management level would realize a 30-100% reduction in option compensation. Grants to firm executives would be cut by 20 – 30%.

More recently, *The Wall Street Journal*/ Mercer Human Resource Consulting CEO Survey and Compensation Trends (May 2005) finds that option compensation for CEOs in 350 of the largest U.S. public companies had dropped from 76% of long-term incentive pay in 2002 to 57% in 2004. Clearly, these firms are assessing the cost of stock option compensation with associated benefits and are making changes in compensation plans in anticipation of mandatory option recognition.

3.3 Pay-performance sensitivity of CEO option grants

3.3.1 Measurement of theoretical variables

The incentive relation between option compensation and shareholder wealth is a consideration in granting stock options. Research has shown several factors are influential in determining the incentive benefit of executive option compensation. These factors are included in the following model.

$$\text{Ln(incentive)}_{i,t} = \gamma_0 + \gamma_1 \text{ln(sales)}_{i,t} + \gamma_2 \text{leverage}_{i,t} + \gamma_3 \text{growth}_{i,t} + \gamma_4 \text{ownership}_{i,t} + \gamma_5 \text{noise}_{i,t} + \gamma_6 \text{(industry dummies)} + \eta_{i,t}$$

The dependent variable, *ln(incentive*), measures the change in value of the options in the CEO's portfolio for a 1% change in stock price. The methodology for measuring option incentive is provided in Appendix A.

The determinants of option incentives are described below.

Option incentives tend to be higher in larger firms due to the complexity of managing the operations (Baker and Hall, 1998; Core and Guay, 1999). Using the *ln(sales)* as a proxy for size, a positive relation between size and option incentives is anticipated.

Leverage of the firm is measured as total liabilities divided by total common equity. Highly levered firms use less equity-based compensation to alleviate creditors' concerns about wealth transfer between debt-holders and shareholders. Furthermore, debt-holders require higher premiums to protect themselves against potential risk-taking when management and shareholder interests are closely aligned (Bagnani et al., 1994).

To mitigate debt-holders' concerns, incentive payoffs from option grants should be inversely related to leverage (John and John, 1993; Bryan et al., 2000).

Firms with larger growth opportunities are more difficult to manage and require greater monitoring by shareholders to ensure interest alignment is maintained. Research supports the theory that firms with more growth opportunities have greater option sensitivities (Smith and Watts, 1992; Core and Guay, 1999; Bryan et. Al., 2000). The proxy for the firm's growth opportunities (*growth*) is the natural log of the ratio of book value of assets to the market value of assets, where market value of assets is calculated as the market value of equity plus liquidating value of preferred stock plus short-term liabilities minus short-term assets plus book value of long-term debt (Chung and Pruitt, 1994). The ratio of book to market value of assets is actually the inverse of the firm's investment opportunity set. Accordingly, the relation between option incentive and growth opportunities is expected to be negative.

The CEO's level of ownership (*ownership*) in the firm, measured as the percent of shares held, influences the required option incentive desired. Share ownership serves to commit manager's actions to those that maximize the value of the firm as he benefits directly by virtue of his investment in the firm. When stock ownership levels are high, the incentives provided by stock option grants are diminished (Mehran, 1995; Bryan et al., 2000). The correlation between stock ownership and option incentive is expected to be negative.

Executive performance is often evaluated using both accounting measures and market measures. If a measure does not provide a clear assessment of the results of the

manager's actions, the measure is described as noisy. If the relative noise in one set of measures is greater than in another, the firm should place more emphasis on the measure that has the greater signal to noise content. Hence, a relative measure of the *noise* in performance measures can be calculated as the ratio of noise in an accounting measure to the noise in a market measure. Lambert and Larcker (1987) estimate the relative noise in performance measures as the variance of the year-to-year change in return on equity to the variance of stock returns. In the model, relative noise in performance measures is calculated as the standard deviation of the change in return on equity over the prior 5 years divided by the standard deviation of the prior 5-year stock returns. The larger the noise ratio, the greater is the noise in the accounting measure relative to the market measures; hence, greater emphasis should be placed on option compensation to increase option sensitivity.

Several regression methods are used to analyze the pay-performance sensitivity of CEO stock options. In addition to OLS regression, a Tobit regression is performed with dependent variables censored at zero since there are 192 firm-year observations with zero-valued dependent variables. Panel data analysis of the model is also used to control for firm effects of option pay-performance sensitivity. To test the difference of pay-performance sensitivity of CEO option compensation between expensing and non-expensing firms, interaction terms are included. Each variable is multiplied by an indicator variable, *group*, that equals 0 for non-expensing firms and equals 1 for expensing firms.

3.3.2 Data and descriptive statistics

The data set of expensing and non-expensing firms is described in section 3.2. The initial data set includes 125 firm-year observations for expensing firms representing 40 firms, and 1651 firm-year observations for non-expensing firms representing 545 firms. The model is estimated using CEO compensation data and firm data from 1998 – 2001 obtained from ExecuComp and Compustat databases. Stock return data is from CRSP database. The computation of the noise measure requires five consecutive years of accounting performance measures and of market performance measures. Eighty-three (83) firm-year observations did not satisfy the requirement; therefore, the data set was reduced to 1693 firm year observations, representing 38 expensing firms (121 firm-years) and 509 non-expensing firms (1572 firm-years).

Tables 3.7 and 3.8 provide descriptive data on the variables in the data set. In Table 3.7 the mean of the model parameters are shown for the full set of firms and for the expensing and non-expensing sets of firms. Incentive value, the measure of the change in CEO wealth for a 1% change in stock price, is not statistically different between expensing and non-expensing firms. However, the transformed measure of incentive value, *ln(incentive)*, is different between the two data sets at the 5% level. Expensing firms are larger and more levered than non-expensing firms. Recall the variable measuring growth opportunities is calculated such that smaller values indicate greater growth potential in the firm. In this data set, expensing firms have more growth opportunities, supporting the belief that firms with greater potential future income are

Table 3.7 Mean values and difference in means analysis

	All firms		Non-expensing firms		Expensing firms		Exp vs. non-exp
Variables	Mean	Std dev	Mean	Std dev	Mean	Std dev	p-value
incentive ($)	660.705	2029.334	656.082	2077.505	720.770	1248.460	0.302
ln(incentive)	4.633	2.366	4.597	2.368	5.092	2.292	0.011
sales ($b)	6.668	17.276	4.839	8.752	30.428	50.914	< 0.0001
ln(sales)	7.577	1.624	7.457	1.561	9.139	1.628	< 0.0001
leverage	2.263	7.551	2.174	7.719	3.415	4.756	0.004
growth	1.121	1.773	1.134	1.822	0.944	0.913	0.023
ownership	2.045	5.561	2.059	5.564	1.868	5.546	0.358
noise	0.375	1.357	0.375	1.405	0.371	0.341	0.468

Table 3.8 Median values and difference in medians analysis

Variables	All firms Median	Non-expensing Median	Expensing Median	Exp vs. non-exp p-value
incentive ($)	155.613	148.149	253.171	0.0060
ln(incentive)	5.054	5.005	5.538	0.0061
sales ($b)	1.825	1.695	7.919	<0.0001
ln(sales)	7.509	7.435	8.977	<0.0001
leverage	1.325	1.283	2.082	<0.0001
growth	0.833	0.834	0.798	0.7820
ownership	0.248	0.261	0.140	0.0002
noise	0.176	0.169	0.283	0.0001

better able to accommodate option expense. Although stock ownership by the CEO is greater for non-expensing firms, it is not statistically different between firm sets. The mean value of the noise in return on equity relative to the noise in stock return is slightly greater for non-expensing firms, but not statistically different from the measure for expensing firms. The medians of the variables and results of the Wilcoxon rank sums difference in medians test are shown in Table 3.8. The differences in median values between the data sets are similar to the differences in means except for the *incentive*, *growth*, and *noise*. The median value of *incentive* pay is larger in expensing firms and statistically different from the median value in non-expensing firms whereas the mean values are not statistically different. The difference in median value of *growth*

Table 3.9 Correlation coefficients – pay-performance sensitivity variables

Panel A: All firms

Variable	ln(incentive)	ln(sales)	leverage	growth	ownership	noise
ln(incentive)	1.000	0.348	0.007	-0.276	-0.148	0.058
ln(sales)	0.400	1.000	0.105	-0.098	-0.096	0.056
leverage	-0.002	0.456	1.000	0.005	0.084	0.210
growth	-0.452	-0.076	0.221	1.000	0.053	-0.017
ownership	-0.119	-0.320	-0.174	0.092	1.000	-0.021
noise	-0.002	0.139	0.282	0.032	-0.171	1.000

Panel B: Non-expensing firms

Variable	ln(incentive)	ln(sales)	leverage	growth	ownership	noise
ln(incentive)	1.000	0.342	0.010	-0.280	-0.139	0.060
ln(sales)	0.387	1.000	0.086	-0.082	-0.088	0.058
leverage	-0.032	0.440	1.000	0.014	0.088	0.211
growth	-0.475	-0.052	0.262	1.000	0.055	-0.017
ownership	-0.105	-0.314	-0.163	0.096	1.000	-0.020
noise	-0.009	0.135	0.265	0.031	-0.163	1.000

Panel C: Expensing firms

Variable	ln(incentive)	ln(sales)	leverage	growth	ownership	noise
ln(incentive)	1.000	0.397	-0.120	-0.209	-0.257	0.026
ln(sales)	0.566	1.000	0.335	-0.418	-0.209	0.111
leverage	0.203	0.378	1.000	-0.317	0.002	0.285
growth	-0.199	-0.381	-0.267	1.000	0.007	-0.130
ownership	-0.221	-0.436	-0.173	0.036	1.000	-0.070
noise	0.010	-0.006	0.312	0.023	-0.250	1.000

is greater for expensing firms but not statistically different from median growth in the non-expensing firms. The median *noise* measure is greater for expensing firms and is statistically different from the median noise measure for non-expensing firms, whereas difference in means is not statistically different.

Correlation coefficients for the variables are found in Table 3.9. Panel A shows the correlations using the full set of firms, while panel B provides information for the non-expensing firms, and panel C contains the data for the expensing firms. In each panel, the upper triangle presents the Pearson correlation coefficients and the lower triangle shows the Spearman correlations. The greatest correlation is found in the expensing firm data with a value of 0.566 for the relation between the *ln*(*incentive)* and *ln(sales)* variables. Other relations worth noting are those between *ln*(*incentive)* and *leverage*, and between *growth* and *leverage*. For non-expensing firms, the correlation between *ln*(*incentive)* and *leverage* is positive (negative) for Pearson (Spearman) correlations. The opposite is found for expensing firms: Pearson (Spearman) correlation between *ln*(*incentive)*and *leverage* is negative (positive). The Pearson and Spearman correlations between *leverage* and *growth* is positive for non-expensing firms but negative for expensing firms.

3.3.3 Regression results

Four regression methods are used to analyze the data. All four methods are reported in Table 3.10, although the results are generally consistent among the methods. For each method, the results are reported both with and without interaction terms between the variables and an indicator variable to denote expensing firms. Ordinary least squares is the first method used. The t-statistics reported are corrected for heteroskedasticity of the error terms using the White correction method (White, 1980). Model 1 shows that sales, growth opportunities, CEO stock ownership, and relative

Table 3.10 Regression results – pay-performance sensitivity

	OLS		Tobit		Fixed Effects		Random Effects	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Variable	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (z-stat)	Estimate (z-stat)
Intercept	1.936 (4.36)*	1.849 (4.08)*	1.653 (3.70)*	1.554 (11.90)*	0.933 (0.82)	0.697 (0.60)	0.948 (2.52)*	0.90 (2.28)*
Group		-0.869 (-0.84)		-0.906 (-0.57)				-0.417 (-0.20)
lnsales	0.489 (13.11)*	0.510 (12.67)*	0.516 (13.91)*	0.542 (13.64)*	0.476 (3.12)*	0.432 (2.79)*	0.473 (9.77)*	0.482 (9.33)*
lnsales*group		0.095 (0.87)		0.108 (0.67)		0.993 (1.48)		0.109 (0.51)
leverage	-0.008 (-0.96)	-0.004 (-0.57)	-0.007 (-0.94)	-0.003 (-0.37)	-0.002 (-0.42)	-0.008 (-0.14)	-0.004 (-0.77)	-0.002 (-0.38)
leverage*group		-0.147 (-3.32)*		-0.192 (-3.27)*		-0.088 (-2.10)**		-0.109 (-2.86)*
growth	-0.303 (-3.72)*	-0.306 (-3.63)*	-0.323 (-9.56)*	-0.326 (-9.63)*	-0.095 (-4.20)*	-0.094 (-4.15)*	-0.148 (-6.80)*	-0.146 (-6.72)*
growth*group		0.044 (0.18)		0.020 (0.07)		-0.643 (-1.37)		-0.389 (-1.38)
ownership	-0.046 (-4.16)*	-0.044 (-3.79)*	-0.055 (-5.12)*	-0.052 (-4.72)*	-0.047 (-2.26)**	-0.047 (-2.25)*	-0.044 (-3.59)*	-0.041 (-3.26)*
ownership*group		-0.024 (-0.61)		-0.030 (-0.70)		-0.003 (-0.01)		-0.039 (-0.75)
noise	0.065 (2.79)*	0.060 (2.73)*	0.067 (1.54)	0.061 (1.40)	-0.034 (-0.63)	-0.029 (-0.55)	0.007 (0.15)	0.009 (0.20)
noise*group		0.144 (0.33)		0.246 (0.37)		-0.415 (-0.63)		-0.464 (-0.83)
Industry indicator?	Yes	Yes	Yes	Yes	No	No	No	No
Adj R-sq	0.204	0.209						

noise of accounting to market performance measures are important determinants in the pay-performance sensitivity of CEO stock options. Each variable enters the model with the correct sign. Leverage, however, is not a factor in the incentive value of the option portfolio in model 1. Model 2 includes interaction terms between each variable and an indicator variable, *group*, that equals 1 if the firm is an expensing firm. In this model, the results are the same as Model 1 with the addition of a significant coefficient on the leverage terms associated with expensing firms.

Tobit regression model is considered because the dependent variable is censored at zero. In the data set, 192 observations have the dependent variable equal to zero. The standard errors are corrected for unequal variance in the error terms. The results for the Tobit regression, without and with the interaction terms, are similar to the OLS models except for the *noise* variable. In the Tobit models, *noise* does not contribute to the pay-performance measure of CEO option portfolio. As in the OLS model, *leverage* is important for expensing firms only.

A panel data approach is explored using fixed effects and random effects modeling. The fixed effects model allows for firm-effects and time-effects. Firm-effects control for omitted variables that are associated with the individual firms, whereas time-effects considers the variation in the model across time. Random effects model assumes that differences between firm and year are random and not firm-specific. Fixed effect model results are reported in Models 5 and 6; random effects are reported in Models 7 and 8. The fixed effects model without interaction terms (Model 5) shows results *ln(sales)*, *growth*, and *ownership* enter the model significantly and as

expected. Similar to the Tobit model, *noise* is not a contributing factor in the incentive sensitivity of CEO option compensation. When interaction terms are added (Model 6), *leverage* enters the model for the expensing firms only. The random effects model results are reported in Models 7 and 8. The results are similar to the fixed effects model except that the intercept is significant in the random effects model. A Hausman test was performed to compare the fixed effects model against the random effects. The null hypothesis for the test is that the fixed effects model is better than random effects model. The χ^2 value from the test is 79.70 with a p-value of < 0.0001; thereby suggesting the random effects model is better.

Although there are differences in the model results, similarities in the models suggest that firm size, growth opportunities, and stock ownership contribute to the pay-performance sensitivity of CEO option compensation. Leverage is a contributor to sensitivity only for expensing firms. The relative noise of the accounting measure of firm performance to the market measure is important only in the OLS models.

3.3.4 Discussion

Pay-performance sensitivity of CEO option compensation serves to align managers and shareholders' interests by providing incentives to CEO to take actions that increase firm value. High quality firms should structure option pay to achieve strong alignment of interests. If the decision to expense stock option pay is a signal of high quality firms, then stock option pay to CEOs in expensing firms should better align the executive's interests with shareholders' interest. The regression results support previous research findings on determinants on pay-performance sensitivity. Incentive

sensitivity of CEO option compensation increases with firm size and growth opportunities and decreases in CEO stock ownership for both expensing and non-expensing firms. However, this research shows that leverage is a contributor to option sensitivity only for expensing firms. For these companies, greater leverage reduces the sensitivity of option pay. If the compensation to CEOs motivates them to take excessive risks, debt holders require increased returns since the potential for risk shifting from shareholders exists. By lowering the pay-performance sensitivity of option pay, the firm reduces the demand for premiums from the debt holders. Shareholders benefit because the firm does not have to pay higher premiums to creditors.

CHAPTER 4

RENT SEEKING EXECUTIVES AND THE DECISION TO EXPENSE STOCK OPTION COMPENSATION

4.1 Economic determinants of stock option grants

4.1.1 Stock options: incentive alignment or rent extraction

Stock option compensation can be a solution to the agency problem of a firm as well as a source of the agency problem. Option compensation resolves agency problems associated with separation of ownership and control by aligning shareholder and management interests (Jensen and Meckling, 1976). Evidence shows that option compensation can serve to improve firm performance and encourage risk-averse executives to implement risky positive net present value projects. Thus, stock option compensation provides the link between shareholders' and managers' interests by encouraging risk-averse executives to increase firm value through implementation of positive net present value projects.

A link between stock option pay and firm performance has been documented by Mehran (1995), Frye (2004), Kedia and Mozumdar (2002), and Hanlon et al. (2003). These researchers find a positive association between option pay and measures of firm performance. The use of stock option compensation is shown to be greater in firms with more growth opportunities. Lewellen et al. (1987), Smith and Watts (1992),

Mehran (1995), and Ragjopal and Shevlin (2002) find strong relation between a firm's growth opportunities and executive stock option pay. Executives benefit from increases in stock price when a substantial portion of their compensation comes from the firm's equity. By motivating managers to accept positive net present value projects, stock option pay serves to increase shareholder wealth as well as management's wealth.

Although there are benefits to shareholders from executive stock option pay, there is also evidence that option pay is a means for executives to extract rents from the firm to the detriment of the shareholders. When managers have 'managerial power' over compensation practices, executive compensation becomes part of the agency problem in a firm (Bebchuk and Fried, 2003). Stock option compensation is a less visible way for executives to increase pay since option pay is disclosed in the footnotes of a firm's annual report rather than recognized in financial statements.[11] CEOs at firms with greater agency problems often receive greater levels of compensation even though the firms perform poorly (Core et al., 1999). Tian (2004) finds that granting more options leads to greater incentives to increase stock price only if the option wealth as a fraction of executive wealth does not exceed a critical threshold, which can be as low as 40%. There is evidence that management pay practices are often constructed to benefit management with little regard to shareholder interests. When the Internal Revenue Service adopted Section 162(m) in 1993 restricting deductibility of non-

[11] Researchers have found that recognizing an accounting amount is perceived differently than disclosing the amount. Espahbodi et al. (2002) examined the returns to stocks when FASB proposed requiring firms to recognize stock-based compensation. They find significant negative returns to stock when FASB's Exposure Draft was released in June 1993. When FASB reversed its decision and allowed firms to disclose rather than recognize stock-based compensation expense, returns to stocks were again significantly negative. Leuz and Verrecchia (2000) and Barth et al. (2003) also find disclosure of information is less informative than recognition of the data.

performance based executive compensation to $1 million, firms adjusted pay away from salaries and toward performance-based pay, such as bonus and stock option. Hall and Liebman (2000) find that for all executives the decrease in salary as a result of adjustment for 162(m) was offset by increases in bonus and stock option grants. For CEOs, however, the increase in bonus and stock options was greater than the associated decrease in salary. Similarly, Perry and Zenner (2001) find that firms with executive salaries at or above the $1 million deductibility cap reduced salaries after 162(m) was enacted. Additionally, firms most likely to be affected by the regulation experienced lower growth in salaries after 1993; although, total compensation increased as firms substituted performance-based pay for salary.

Yermack (1998) finds that after the Securities and Exchange Commission provided disclosure requirements for executive stock option compensation, firms altered data inputs and subsequently undervalued options by 8.9% from a benchmark option value calculated by Yermack. By lowering the value of stock option compensation, firms were able to avoid criticism by investors. Similarly, after FASB revised FAS123 in 2004 and required firms to begin expensing stock options in June 2005, firms began changing parameter assumptions to reduce stock option value. *The Wall Street Journal* reported on December 7, 2004 that Cisco changed the time to exercise stock options grants from 5.6 years to 3.3 years in their option valuation model, lowering the value of the reported stock options by $300 million.

Bebchuk and Fried (2003) suggest that firms could improve compensation practices to enhance incentive alignment but choose not to because such changes would

harm executives. They suggest that using indexed options, issuing out-of-the money options, and requiring executives to hold stock for a specified period after option exercise would improve alignment with shareholder interests. However, because each of these changes potentially reduces executive wealth, firms elect to continue with status quo of granting at-the-money options with no holding period requirement for stock obtained from option exercise.

The extent of rent extraction from option grants can be measured by examining the residuals from the model of economic determinants of stock option grants. From an extreme optimizing perspective, all firms would be optimizing level of option grants at all times. However, Ittner and Larcker (2001) suggest such extreme optimizing perspective fails to acknowledge that organizations are learning and moving toward an optimal level. Additionally, the optimal level is not static due to changes in incentives provided by the executives' option and stock portfolios as well as changes in firm characteristics that impact optimal level of option grants (Core and Guay, 1999). Furthermore, deviations from optimal level of option grants may reflect rent extraction by the executives.

Yermack (1998) uses residuals from model of determinants of CEO pay as a measure of excess compensation. He finds that firms where CEOs receive excessive pay apply the greatest discounts in reported value of executive stock option grants.

Deviation from optimal level of option grants has been used to determine the effect on firm performance. Ittner et al. (2003) examine the residuals from option grant model for new economy firms, separating them into two variables: one for positive

residuals and the other for negative residuals. They find firms with executives having lower than expected option holdings have lower firm performance. However, in firms where executives hold lower than expected equity levels, firm performance is improved. Hanlon et al. (2003) use deviation from optimal equity grants to measure the impact on earnings level. They find that random deviations from optimal grant levels have no economically important impact to earnings.

This essay considers a model of economic determinants of executive option grants using variables previously shown to impact grant level. Residuals from the model are used as a measure of deviation of executive option pay from optimal grant level. Positive residuals suggest the firm is over granting stock option pay, potentially signaling rent extraction by the executives. Although, negative residuals imply the firm is not maximizing incentive alignment from option grants, executives in these firms are not extracting rents at the expense of the shareholders.

Of interest is whether excessive option grants influence the decision to expense stock option pay. To evaluate this effect, residuals from the economic determinant model of executive stock option grants are used as an independent variable in the logistic regression model examining the decision to expense stock options (Refer to Chapter 2). If the decision to voluntarily expense stock options is used by firms to signal their superior quality, then firms that choose to expense options will not use compensation packages that extract rents from the firm. Lower quality firms using stock option pay in excess of optimal levels will not be able to mimic expensing firms' recognition decisions since option compensation is excessive. If non-expensing firms

are granting excessive option pay, they need time to renegotiate compensation contracts to bring option pay back to appropriate levels.

The hypothesis under evaluation is:

1. Firms that over-grant option compensation will be less likely to expense option compensation.

4.1.2 Economic determinants of stock option grants

Managerial effort and decision-making are not transparent to the firm owners; consequently, compensation contracts are structured to motivate managers to act in the best interest of the shareholders. Stock option grants play an important role in reducing information asymmetry between owners and managers. Along with current option grants, the executive's existing portfolio of firm stock and options provide incentives to align with shareholders. Yet these holdings also influence future benefits of additional stock option grants. If existing stock and option holdings optimally align executive interests with the interests of shareholders, additional grants provide little additional incentives. Core and Guay (1999) find that executives holding equity portfolios above (below) optimal incentive levels receive fewer (greater) grants of stock options in the subsequent year bringing the portfolio back into alignment. Furthermore, the risk borne by the executive for holding an undiversified portfolio is magnified by additional option grants. Executives with larger holdings of stock or stock options should, therefore, receive fewer option grants. Mehran (1995), Matsunaga (1995), and Hanlon et al. (2003) find as equity holdings of executives increase, fewer options are granted. The negative correlation between executive portfolio and subsequent option grants is a

recent phenomenon. Examining executive compensation for 49 corporations during the period from 1964 – 1973, a time prior to the explosive growth of option compensation in executive contracts, Lewellen et al. (1987) do not find a relationship between stock holdings and subsequent option compensation. Similarly, Kole (1997) finds no relation between the existence of stock option compensation plans of Fortune 500 firms in 1980 and shares held by the firms' officers and directors.

Firm size is also a determinant of the executive compensation package. Generally, larger firms are more complex and require higher skilled managers. Monitoring managerial actions in larger firms is more difficult since the visibility and consequences of management decisions are less transparent. Accordingly, managers in larger, more complex firms receive larger grants of stock option compensation with the intent to maintain managers' focus on investing in value-maximizing projects (Smith and Watts, 1992; Core et al., 1999; Core and Guay, 1999; Ittner et al., 2003). The relation between stock option usage and firm size is not strictly monotonic (Baker and Hall, 1998; Himmelburg et al., 1999). CEO incentive compensation increases at a decreasing rate with firm size. Thus, as firm size increases, the incentive value of additional stock option grants increases but at a diminishing rate.

The growth opportunities available to the firm influence the level of incentive compensation granted. Firms with many growth opportunities can be more challenging to manage. Increased monitoring costs associated with managing a complex set of investment opportunities make stock option compensation suitable for reducing agency costs of the firm. As the growth opportunities of the firm increase, so does the use of

stock option grants for the firms executives (Lewellen et al., 1987; Smith and Watts, 1992; Kole, 1997; Core et al., 1999; Core and Guay, 1999; Bryan et al., 2000; Hanlon et al., 2003).

Stock option compensation requires no cash outlay, nor is it recognized as an expense against income on the firm's income statement.[12] For that reason, firms that are cash constrained can substitute stock option compensation for cash compensation to maintain a competitive compensation package to its employees without having to raise or use cash. Cash availability is proxied by measures of free cash flow or by the firm's ability to pay cash dividends to shareholders. Firms with lesser amounts of free cash flow or with small dividend payments are deemed to be cash constrained. Research supports the conjecture that cash constrained firms use greater levels of stock option compensation for CEOs (Yermack, 1995; Dechow et al., 1996; Core and Guay, 1999; Bryan et al., 2000). Comparing the use of equity compensation by new economy firms and old economy firms, Ittner et al. (2003) show as the firm becomes more cash constrained, the use of equity compensation by new economy firms increases. For old economy firms, however, the opposite is true. As the firm's available cash increases, more equity is used in the CEO compensation contract. While Hanlon et al. (2003) do not find cash constraint a determining factor in the use of stock option compensation for the firm's top-five compensated employees, they do find that dividend-constrained firms include more option grants in the executives' compensation contracts. Hanlon et

[12] Prior to June 2005 stock options granted with an exercise price at or above the current market price and in accordance with a shareholder approved plan do not have to be reported as an expense against earnings. FASB will require firms recognize the vesting portion of stock option grants on the firm's income statement beginning in June 2005.

al. suggest the dividend constraint measure is a proxy for cash constraint and the positive relation between dividend constraint and stock option grants supports the theory that cash constrained firms substitute stock option compensation for cash compensation. An opposing theory is that the relation between dividends and stock option grants results from the effect of stock dividends on option value. Option grants to executives are not adjusted for dividend payments; hence, executives in firms using option compensation benefit when the firm has a low dividend rate (Lewellen et al., 1987; Fenn and Liang, 2001).

Firms choosing to disclose option compensation lose the tax-shield associated with recognizing option grants. The greater the portion of compensation awarded in stock option grants and the higher the firm's marginal tax rate, the larger the cost of the lost tax deduction. Firms with higher marginal tax rates can take advantage of tax savings by substituting tax-deductible cash compensation for stock option compensation (Dechow et al., 1996; Bryan et al., 2000; Hanlon et al., 2003).[13]

Option compensation is granted with the objective of motivating managers to improve firm performance. Measures of firm performance include stock returns and accounting returns, such as return on equity or return on assets. If executives are rewarded for superior firm performance with additional equity compensation, superior firm performance should lead to more stock option grants (Eaton and Rosen, 1983;

[13] A firm could choose to expense the stock option compensation, which would lower its tax payments. However, the trade-off between option compensation and cash compensation is not dollar for dollar. The value of the risky stock option to the manager is substantially less than the cost of the option to the firm (Meulbroek, 2001) . Therefore, the firm grants a greater quantity of options to compensate for the inherent risk. Expensing stock option compensation would result in a substantially greater charge to earnings than substituting cash compensation for option grants.

Mehran, 1995; Core et al., 1999; Core and Guay, 1999; Hanlon et al., 2003). Murphy (1985) finds a negative relation between firm performance and option pay, suggesting the firm's board of directors may award option compensation in low performing years to motivate executives to improve firm performance.

The use of debt by a firm is a consideration in constructing the executive compensation package. Debt holders understand the risk-shifting incentives inherent in the use of stock option compensation and extract a higher risk premium for bearing the additional risk from management's lower risk aversion. Consequently, firms utilizing greater leverage tend to grant fewer options to its executives to reduce both the risk-taking behavior of managers and the risk premium to debt-holders. John and John (1993), Bryan et al. (2000), and Ittner et al. (2003) find evidence supporting the risk-shifting theory; however, other researchers find no link between leverage and executive compensation (Mehran, 1995; Yermack, 1995; Dechow et al., 1996; Hanlon et al., 2003).

If firms are optimizing option grants at all times, then residuals from the economic determinants of stock option grants would occur only because of measurement errors, omitted variables, or misspecified functional form of the model. However, Ittner and Larcker (2001) argue that this 'extreme optimizing' perspective fails to consider that firms are continually learning and moving towards optimal level of option grants. Moreover, firm and manager characteristics that contribute to optimal grant levels change over time requiring firms to continually adjust incentive grant levels. Assuming the economic determinants model is of correct functional form,

variables are measured correctly, and all relevant independent variables are included, in a cross-sectional sample of firms, it is reasonable to think that firms are distributed around the optimal choice of option grants and the residual from economic determinant model represents the departure from optimal grant level.

4.1.3 The decision to expense

Chapter 2 in this thesis describes the factors that impact the decision to expense stock option compensation voluntarily. A brief summary is presented in this section. Accounting choice and adoption timing research examines the decision of firms' choice of alternate accounting treatments and of standard adoption timing along three dimensions: efficient contracting, earnings management, and information signaling. Efficient contracting theory of accounting choice considers the effect of firm size and leverage as factors influencing management decisions. Specifically, larger firms bear greater political costs from increased publicity and scrutiny; consequently, larger firms make choices that reduce unfavorable response by outsiders. Leverage measures proxy for closeness to debt covenant restrictions. Highly levered firms make accounting choices that move the firm further away from violating debt covenants.

Earnings management perspective of accounting choice considers the firm's profitability, the impact of the choice on reported earnings, and the implications of the choice on management bonus. Firms with greater and more stable earnings have more choices on accounting methods and adoption timing. Generally, firms make choices that have the least detrimental effect on reported earnings. Also, accounting choice is affected if management pay is contingent on firm performance as measured by earnings

level or growth. An accounting method that decreases reported income is less likely to be used if the reduction in earnings affects bonus payout.

4.2 Measurement of theoretical variables

Economic determinant model of stock option grants uses the sum of the value of stock option grants to the top five compensated executives scaled by sales (*ESO/S*) as the dependent variable. The value of the option grants is reported in the ExecuComp database. The variables used to model the level of executive stock option grants are well-documented determinants in the literature.

Executive portfolio. The existing stock option portfolio and stock ownership influence subsequent level of option grants. Core and Guay (1999) find the level of future stock option grants are determined by the deviation of stock option portfolio from the optimal level. If the executive's portfolio is suboptimal, subsequent option grants bring the portfolio back to optimal level. The executive's stock option portfolio, *Prior ESO,* is measured as the value of in-the-money options held by the executives. The value of these options is the intrinsic value of the options, calculated as the difference between the stock price and the exercise price times the number of options in the grant. The value of the outstanding option grants is scaled by sales. The effect of existing portfolio of option grants will depend upon whether the incentive level of the portfolio is above or below the optimal level. Option portfolios below optimal level should lead to additional current year option grants. Similarly, portfolios greater than optimal level should lead to fewer current year option grants. Therefore, if option grants serve to move the executive toward the optimal incentive level, the relation between option

portfolio and current year grants should be negative. However, if firms use option pay to extract rents for the executives, current year grants could be positively related to current option portfolio.

The executive's stockholdings also are important in determining option grants. If the current portfolio of stock and options serves to align the interests of shareholders and manager, subsequent option grants would not provide additional benefit to reduce agency costs (Matsunaga, 1995; Mehran, 1995; Hanlon et al., 2003). The executive's portfolio of firm stock, *prior ownership,* is represented by the beneficially owned shares as a percentage of total shares outstanding. As stockholdings increase, the level of option grants is expected to decrease.

Firm size. Larger firms are more difficult to manage and require more highly skilled executives. Executives with greater skill and experience command higher levels of pay. Accordingly, the compensation contract includes greater use of option compensation. Using *ln(sales)* as a proxy for firm size, the relation between size and option grants is expected to be positive.

Growth opportunities. Firms with more investment opportunities can be more difficult to manage, thus, executives with greater skill sets are required to effectively manage the firm. Additionally, monitoring costs for firms with more growth prospects are greater as the shareholders have limited visibility to the portfolio of projects and management decisions regarding the projects. Linking a portion of the executive's pay to firm performance provides the motivation for the managers to pursue value-maximizing projects. Many researchers have found stock option compensation

increases as the growth opportunities for the firm increase (Lewellen et al., 1987; Kole, 1997; Core and Guay, 1999; Hanlon et al., 2003). A proxy for the firm's growth opportunities, *growth*, is the book-to-market value of assets measured as the natural log of book value of assets scaled by market value of assets. This variable is the inverse measure of the perceived growth potential of the firm (Lewellen et. al, 1987; Smith and Watts, 1992; Gaver and Gaver, 1995; Yermack, 1995; Core and Guay, 2001; Hanlon et al., 2003). Market value of assets is calculated as the market value of equity plus liquidating value of preferred stock plus short-term liabilities minus short-term assets plus book value of long-term debt (Chung and Pruitt, 1994). The use of stock options compensation is expected to increase with the growth opportunities of the firm. Firms with high growth opportunities should use more stock option compensation as a way to monitor and motivate management's investment decisions. Thus, a negative parameter estimate for book to market value of assets is anticipated.

Cash constraints. Option compensation provides a way for firms to be competitive in its compensation contracts while conserving cash. Cash-constrained firms can substitute option compensation to reserve cash for operations or investment opportunities. The proxy for the firm's c*ash constraint* is the preceding 3-year average of cash flow from investing activities plus common dividends plus preferred dividends less cash flow from operations, divided by total assets (Core and Guay, 1999; Hanlon et al., 2003). The value of this variable will increase as the degree of cash constraint intensifies. If cash constrained firms substitute option grants for cash compensation, the

parameter estimate for this variable should be positive; that is, as firms become more cash constrained, option grants will increase.

Marginal tax rate. The marginal tax rate of a firm has been recognized as a determinant in the level of option grant compensations. Firms with high marginal tax rates can lower taxable income by using tax-deductible cash compensation in lieu of option compensation. Conversely, firms with low marginal tax rates experience a smaller benefit for using option compensation in place of an equivalent amount of cash compensation. Indicator variables are used to proxy high and low marginal tax rate (Ittner et al., 2003). *High tax* equals 1 if pretax income is greater than 0 and net operating loss carry-forward equals 0; otherwise, *high tax* equals 0. *Low tax* is set to 1 if pretax income is less than 0 and net operating loss carry-forward is greater than 0; otherwise *low tax* equals 0. Firms with high marginal tax rates should be negatively correlated with the level of stock option grants while firms with low marginal tax rates should be positively correlated.

Firm performance. In addition to the interest alignment incentive of stock option grants, options can also be granted as a motivation to improve firm performance. Measuring firm performance using market measures can be misleading since the value of stock option grants depends on the value of the firm's stock. Using an accounting measure of performance eliminates the circularity of option value and stock price. The firm's return on assets is measured as pretax income divided by total assets. The measure of firm performance is the change in return on assets (*chROA*), calculated as the difference between ROA_t and ROA_{t-1}. If option grants are awarded to reward

executives for superior firm performance, then the level of option grants should be positively related to *chROA*. However, options may be granted to motivate managers in periods of low firm performance (Murphy, 1985). In this situation, the relation between grants and *chROA* will be negative.

Leverage. As firm's leverage increases, the debt holders concerns about risk-shifting also increase. Options can provide managers with the incentive to accept risky projects; debt holders understand that they bear the risk inherent in these projects. Consequently, debt holders require higher premiums for being subjected to increased risk. As the leverage of the firm increases, firms can manage the risk-shifting concern by reducing the incentive to bear risk imposed on managers from option compensation. Therefore, as leverage increases, the use of option compensation is expected to decease. *Leverage* is measured as natural log of the book value of total liabilities scaled by market value of equity.

Other factors. To the extent that risk is associated with the level of option compensation, risk, $\sigma(OI/S)$, is included in the model and measured as the standard deviation of the prior 5 years of the firm's operating income before R&D expenses scaled by sales (Hanlon et al., 2003). Other control variables include industry indicator variables and year indicator variables.

The following model is evaluated to determine factors influencing executive option grants.

$(ESO/S)_{i,t} = \alpha_0 + \alpha_1(\text{Prior ESO})_{i,t-1} + \alpha_2(\text{Prior ownership})_{i,t-1} + \alpha_3 \ln(\text{Sales})_{i,t-1} + \alpha_4(\text{growth})_{i,t-1} + \alpha_5(\text{Cash constraint})_{i,t-1} + \alpha_6(\text{High tax})_{i,t-1} + \alpha_7(\text{Low tax})_{i,t-1} + \alpha_8(\text{chROA})_{i,t} + \alpha_9(\text{Leverage})_{i,t-1} + \alpha_{10}\sigma(OI/S)_{i,t-1} + \alpha_{11}(\text{Industry Indicator}) + \alpha_{12}(\text{Year Indicator}) + e_{i,t}$

The residuals from the economic determinants model are captured and an indicator variable, *residdum*, is constructed that equals 1 if the residual is positive and equals 0 if the residual is negative. If *residdum* equals 1, then actual option grant is greater than expected and the firm is over-granting option compensation. For these firms, option compensation to the executives is excessive and constitutes rent to the executives. These firms would be less inclined to voluntarily expense stock option pay. Alternatively, firms that are not extracting rents would be less concerned about increasing visibility of its compensation program. To determine if the existence of excess option compensation affects the decision to expense options, the residual indicator variable from the economics determinants model is included in the logistic regression model used in Chapter 2 to analyze the decision to expense stock option pay. The model under evaluation is

$$Y=\beta_0 + \beta_1(\text{size}) + \beta_2(\text{leverage}) + \beta_3(\text{EPS}) + \beta_4(\text{volatility}) + \beta_5(\text{growth}) + \beta_6(\text{option}) + \beta_7(\text{portfolio}) + \beta_8(\text{pcnt to top}) + \beta_9(\text{CF shortage}) + \beta_{10}(\text{bonus}) + \beta_{11}(\text{newecon}) + \beta_{12}(\text{insider}) + \beta_{13}(\text{residdum}) + \varepsilon,$$

where Y = 1 if the firm has elected to expense stock option pay, and =0 otherwise.

4.3 Data and descriptive statistics

The data set used in the analysis of economic determinants of option grants is the data used in previous analyses in this thesis. Since the pay-performance regression (Chapter 3) requires current and previous 5 years of option compensation data, the initial data set of 59 expensing firms and 1084 non-expensing firms is reduced to 40 expensing firms and 545 non-expensing firms after observations with missing data are eliminated. The data set includes 1776 firm-year observations of which 1651 are for non-expensing firms and 125 are for expensing firms. Because the model uses previous year variables to model current year option grants, independent variables from the period 1997- 2000 are used to estimate option grants for the period 1998 – 2001. Compensation data is from the ExecuComp database; firm data is from Compustat. To control for outliers, all variables are winsorized at the 1% and 99% levels.

Table 4.1 provides descriptive statistics on the mean values of the variables for the combined data set as well as for the sets of expensing and of non-expensing firms. Current option grants are greater for non-expensing firms compared to expensing firms. Moreover, the portfolio of existing in-the-money options (prior ESO) and portfolio of shares (prior ownership) are greater for non-expensing firms. Growth opportunities are greater for expensing firms (recall lower values of the growth variable indicate greater growth opportunities). Although not significantly different from expensing firms, non-expensing firms have a greater decrease in ROA than expensing counterparts. As demonstrated in prior essays in this thesis, expensing firms are larger and more levered.

Table 4.1 Mean values and difference in means analysis

	All firms		Non-expensing firms		Expensing firms		Exp vs. non-exp
Variables	Mean	Std dev	Mean	Std dev	Mean	Std dev	p-value
ESO/S	0.007	0.022	0.008	0.023	0.001	0.003	<0.0001
Prior ESO	0.029	0.094	0.030	0.097	0.008	0.036	<0.0001
Prior ownership	0.031	0.063	0.031	0.063	0.023	0.056	0.052
ln(sales)	7.491	1.534	7.382	1.479	8.941	1.514	<0.0001
growth	0.611	0.379	0.617	0.379	0.538	0.382	0.013
Cash constraint	-0.192	0.119	-0.192	0.121	-0.184	0.094	0.191
High tax	0.407	0.491	0.408	0.492	0.384	0.488	0.296
Low tax	0.036	0.186	0.038	0.192	0.008	0.089	0.001
chROA	-1.302	8.997	-1.311	9.205	-1.183	5.579	0.408
leverage	0.183	0.879	0.134	0.871	0.823	0.737	<0.0001
σ(OI/S)	0.043	0.105	0.044	0.109	0.023	0.025	<0.0001

Table 4.2 Median values and difference in median analysis

	All firms	Non-expensing	Expensing	Exp vs. non-exp
Variables	Median	Median	Median	p-value
ESO/S	0.002	0.002	0.001	<0.0001
prior ESO	0.004	0.005	0.001	<0.0001
prior ownership	0.007	0.007	0.003	0.002
ln(sales)	7.423	7.321	8.836	<0.0001
growth	0.583	0.586	0.540	0.308
cash constraint	-0.185	-0.185	-0.184	0.926
chROA	-0.465	-0.465	-0.326	0.926
leverage	0.234	0.190	0.763	<0.001
σ(OI/S)	0.019	0.019	0.016	0.308

Comparison of median values for the variables is found in Table 4.2. The Wilcoxon Rank Sums test results for difference in median values are similar to the difference in means. Non-expensing firms grant more options, have larger portfolios of executive stock options, and have more shares owned by the firm's top five executives. Expensing firms are larger and more levered. Median growth opportunities are greater than for non-expensing firms but the difference is not statistically significant. While the mean volatility of operating income is different between expensing and non-expensing firms, the medians are not.

Correlation data between independent variables are shown in Table 4.3. Pearson correlation coefficients are shown in the upper triangle; Spearman correlations are in the lower triangle. Panel a shows correlation coefficients for the full set of data; panel b contains statistics for non-expensing firms; panel c had data for the expensing firms. With the exception of correlations between *prior ESO* and *growth* (Spearman) and *σ(OI/S)* and *prior ESO* (Pearson), correlation coefficients are small for the dataset of all firms. For non-expensing firms, the correlation coefficients are also small except for *prior ESO* and *growth* (Spearman) and *σ(OI/S)* and *prior ESO* (Pearson). For expensing firms, all correlation coefficients are less than 0.50, indicating little correlation among the variables.

4.4 Regression results

4.4.1 Economic determinants of option compensation

The first analysis involves modeling the economic determinants of stock option grants. To control for potential differences in granting practices between expensing and non-expensing firms, interaction terms for each variable are included. The variable is interacted with an indicator variable, *group*, that equals 1 if the firm is an expensing firm and equals 0 otherwise. Regression results are shown in Table 4.4.

The portfolio of in-the-money stock options (*prior ESO*) is positively related to current stock option grants, indicating that the greater the existing portfolio the greater the current year grant of stock options. This result does not support the expectation that firms use current year option grants to optimize the incentive level of option portfolio, but suggests that current year option grants serve to extract rents from shareholders.

Table 4.3 Correlation coefficients – economic determinant variables

Panel a: All firms

Variable	prior ESO	prior ownership	lnsales	growth	cash constraint	high tax	low tax	chROA	leverage	σ(OI/S)
prior ESO	1.000	-0.009	-0.322	-0.278	0.093	-0.089	0.177	-0.033	-0.285	0.542
prior ownership	0.127	1.000	-0.146	0.049	-0.025	0.100	-0.019	0.018	-0.154	-0.034
lnsales	-0.270	-0.389	1.000	-0.089	-0.029	0.086	-0.164	0.027	0.479	-0.398
growth	-0.595	0.085	-0.065	1.000	0.151	-0.100	0.045	-0.013	0.126	-0.112
cash constraint	-0.233	-0.092	0.078	0.169	1.000	-0.089	0.036	0.046	0.205	0.254
high tax	-0.009	0.116	0.070	-0.112	-0.088	1.000	-0.160	-0.044	-0.101	-0.163
low tax	0.001	0.014	-0.133	0.042	0.031	-0.160	1.000	0.069	-0.058	0.168
chROA	-0.018	0.033	-0.013	0.018	0.066	-0.089	0.119	1.000	0.152	-0.029
leverage	-0.361	-0.243	0.470	0.211	0.267	-0.102	-0.050	0.099	1.000	-0.230
σ(OI/S)	0.237	-0.052	-0.374	-0.093	-0.050	-0.182	0.182	-0.017	-0.220	1.000

Panel b: Non-expensing firms

Variable	prior ESO	prior ownership	lnsales	growth	cash constraint	high tax	low tax	chROA	leverage	σ(OI/S)
prior ESO	1.000	-0.012	-0.328	-0.291	0.103	-0.099	0.178	-0.032	-0.287	0.542
prior ownership	0.121	1.000	-0.138	0.049	-0.021	0.100	-0.025	0.025	-0.154	-0.035
lnsales	-0.253	-0.384	1.000	-0.056	-0.044	0.095	-0.163	0.024	0.461	-0.408
growth	-0.637	0.088	-0.042	1.000	0.154	-0.098	0.050	-0.018	0.170	-0.120
cash constraint	-0.238	-0.095	0.074	0.174	1.000	-0.094	0.039	0.042	0.208	0.265
high tax	-0.021	0.113	0.077	-0.108	-0.093	1.000	-0.165	-0.048	-0.098	-0.170
low tax	0.002	0.005	-0.131	0.047	0.035	-0.165	1.000	0.080	-0.058	0.168
chROA	-0.018	0.046	-0.016	0.011	0.060	-0.093	0.129	1.000	0.162	-0.029
leverage	-0.359	-0.227	0.458	0.252	0.269	-0.093	-0.048	0.105	1.000	-0.231
σ(OI/S)	0.243	-0.050	-0.376	-0.105	-0.047	-0.195	0.186	-0.010	-0.234	1.000

Table 4.3 - continued

Panel c: Expensing firms

Variable	prior ESO	prior ownership	lnsales	growth	cash constraint	high tax	low tax	chROA	leverage	σ(OI/S)
prior ESO	1.000	0.016	-0.125	-0.085	-0.279	0.188	-0.021	-0.077	-0.018	0.313
prior ownership	0.046	1.000	-0.203	0.021	-0.082	0.094	0.112	-0.158	-0.085	-0.108
lnsales	-0.218	-0.428	1.000	-0.369	0.123	0.064	-0.073	0.085	0.310	-0.392
growth	-0.121	-0.001	-0.336	1.000	0.112	-0.138	-0.127	0.113	-0.334	0.018
cash constraint	-0.063	0.016	-0.069	0.125	1.000	-0.008	-0.030	0.155	0.176	-0.266
high tax	0.110	0.150	0.041	-0.176	0.002	1.000	-0.071	0.029	-0.127	0.030
low tax	-0.149	0.137	-0.087	-0.127	-0.055	-0.071	1.000	-0.454	0.204	0.011
chROA	0.019	-0.130	0.031	0.110	0.191	-0.027	-0.152	1.000	-0.040	-0.055
leverage	-0.233	-0.208	0.312	-0.257	0.235	-0.162	0.149	0.025	1.000	-0.010
σ(OI/S)	0.072	-0.168	-0.320	-0.009	-0.040	-0.036	0.065	-0.128	0.086	1.000

Table 4.4 Economic determinants regression results

Variable	Expected Sign	Coefficient	t-stat
Intercept		0.020	6.24 *
Group		-0.011	-0.99
Prior ESO	–	0.096	21.39 *
Prior ESO*group	–	-0.113	-2.95 *
Prior ownership	–	-0.010	-1.75 ***
Prior ownership*group	–	0.002	0.10
ln(sales)	+	-0.002	-6.17 *
ln(sales)*group	+	0.0006	0.59
growth	–	-0.003	-2.69 *
growth*group	–	0.002	0.57
cash constraint	+	0.013	4.27 *
cash constraint*group	–	-0.031	-2.03 **
high tax	–	-0.002	-2.51 **
high tax*group	–	0.002	0.56
low tax	+	0.010	5.30 *
low tax*group	+	-0.015	-0.95
chROA	+/–	-0.0001	-3.73 *
chROA*group	+/–	0.0001	0.39
leverage	–	-0.001	-2.10 **
leverage*group	–	0.002	1.07
σ(OI/S)	+/–	0.066	15.89 *
σ(OI/S)*group	+/–	-0.091	-1.51
Adjusted R-square		0.606	

* significant at 1% level
** significant at 5% level
*** significant at 10% level

For expensing firms, however, the relation between option portfolio and current grants is negative. In fact, the absolute value of the coefficient on the interaction term is greater than the coefficient on *prior ESO*, indicating that expensing firms use option grants to optimize the incentive value of the option portfolio.

The relation between current year option grants with *prior ownership*, *growth*, *high tax*, and *low tax* are significant and as expected. The expected relation between *chROA* and option compensation was uncertain. Option compensation could be used to reward management for superior performance. Alternatively, option compensation could be used to increase motivation during poor performing years. In this model, the latter explanation seems reasonable. As ROA decreases, more option compensation is awarded to executives.

Cash constrained firms typically substituted option pay for other forms of compensation; therefore, the relation between option compensation and a measure of cash constraint should be positive. The relationship holds for non-expensing firms but not for expensing firms. The coefficient on the interaction term, *cash constraint*group*, is negative and is greater in absolute value than the coefficient on *cash constraint* variable. This suggests that that the lower the cash constraint, i.e., the greater the cash availability, the more options granted by expensing firms.

The relation between *leverage* and option grants is negative and significant. This result supports the theory that highly levered firms grant fewer stock options to reduce the premium demanded by debt holders when executives have greater incentive to bear risk, potentially shifting the risk burden from shareholders to debt holders.

Unexpected results include the relation between option grants and firm size. Theory suggests that larger firms award greater levels of pay to executives to compensate for increased complexity of managing a large firm. However, the results suggest that the relation between option grants and firm size is negative. Hanlon et al. (2003) report the same negative relation between size and option grants and suggest option grants are negatively related to firm size conditioned on growth opportunities. Another potential explanation of this unusual result is that smaller firms have less cash to use for salaries or bonuses and must use stock options in lieu of cash compensation.

The residuals from the economic determinant model are used as an explanatory variable in the logistic regression model examining the decision to expense stock option compensation. While it is possible that the residuals from the model represent either mismeasurement of the variables and/or omitted variable bias, the variables used is in the economic determinants model were selected based on prior research. Moreover, the estimation of the model is generally consistent with theory and provides high level of explanatory power exhibited by adjusted R-squared value of 61%.

A residual indicator variable, *residdum*, is set equal to 1 for positive residuals and equal to 0 for negative residuals. Positive residuals suggest the firm is over-granting option compensation, perhaps to the detriment of the shareholders. If the decision to grant option compensation is used to signal high quality firms and if a positive residual signals the firm uses option compensation to extract rents from shareholders, then the coefficient on *residdum* should be negative, indicating that firms that over-grant option compensation are less likely to voluntarily expense option pay.

4.4.2 Over-granting option compensation and the decision to expense stock options

Definitions of the variables used in the logistic regression model are found in detail in Chapter 2 and are summarized in Table 4.5. The results of the logistic regression modeling the decision to expense stock option, including the residual indicator variable from the economics determinants model, are presented in Table 4.6. Model 1 replicates the model used in analyzing the decision to expense stock options in Chapter 2. Model 2 uses the same dataset but includes a residual indicator variable from the economic determinants model. The value of the significant parameter estimates are qualitatively the same in both models, although the level of significance changes for the *option*, *pcnt to top*, and *bonus* variables. The *option* and *pcnt to top* variables remain significant at or below the 10% level; *bonus* just misses significance at the 10% level.

The parameter estimate on the residual indicator variable, *residdum*, is negative and significant at the 5% level. The implications of this result is that the probability a firm will expense option compensation voluntarily is reduced when the actual firm option grants are greater than the predicted level. Interpreting a positive residual as an indication the firm is over-granting option pay and extracting rents from the shareholders, the negative coefficient on the residual indicator variable suggests that firms that misuse option compensation are less inclined to expense options.

This result is supported by the results in the pay-performance model presented in Chapter 3, which showed that non-expensing firms experience diminishing earnings

Table 4.5 Logistic regression variables

$Y=\beta_0 + \beta_1(size) + \beta_2(leverage) + \beta_3(EPS) + \beta_4(volatility) + \beta_5(growth) + \beta_6(option) + \beta_7(portfolio) + \beta_8(pcnt\ to\ top) + \beta_9(CF\ shortage) + \beta_{10}(bonus) + \beta_{11}(newecon) + \beta_{12}(insider) + \varepsilon$		
Dependent variable:		
Y= 1 if expensing firm, 0 if non-expensing		
Independent variables	Expected sign	Measure
size	+	= ln(market value of equity)
leverage	+	= ln(debt/equity)
EPS	+	= earnings per share
volatility	–	= standard deviation of change in quarterly income before extraordinary items for the prior 5 years
growth	+/–	= ln(assets/(market value of equity + preferred stock + current liabilities – current assets + long-term debt))
option	–	= average of options as a percent of total compensation for top 5 executives
portfolio	–	= value of in-the-money unvested options held by top five executives scaled by market value of equity
pcnt to top	+	= percent of options granted to top five executives
CF shortage	–	= (cash flow from investing + dividends – cash flow from operations)/assets
bonus	–	= average of bonus as a percent of total compensation for top 5 executives
newecon	–	= 1 if new economy firm, 0 otherwise
insider	+	= percent of shares outstanding held by officers and directors

Table 4.6 Logistic regression results

Logistic model of expensing stock option compensation (1) versus non-expensing (0)					
Variable	Expected sign	Parameter estimate	p-value	Parameter estimate	p-value
Intercept		-9.622	<0.0001*	-9.865	<0.0001*
size	+	0.713	<0.0001*	0.753	<0.0001*
lnleverage	+	0.471	<0.0001*	0.481	<0.0001*
EPS	+	0.125	0.007*	0.124	0.008*
volatility	-	-0.0004	0.959	-0.001	0.896
lngrowth	+/–	1.628	<0.0001*	1.691	<0.0001*
option	-	-0.015	0.023**	-0.013	0.058***
portfolio	-	-78.456	0.117	-74.787	0.134
pcnt to top	+	0.014	0.052***	0.014	0.049**
CF shortage	-	-0.942	0.259	-0.884	0.287
bonus	-	-0.019	0.091***	-0.018	0.109
newecon	-	-0.487	0.261	-0.628	0.157
insider	+	0.029	<0.0001*	0.029	0.001*
residdum	-			-0.522	0.016**
Pseudo R-squared		0.1979		0.2045	

from option compensation, whereas expensing firms realize a linearly increasing relation between option pay and operating income. The curvilinear relation between option grants and operating income for non-expensing firms can be a consequence of over-granting option pay. Returning to accounting choice theory, firms often use the

time until mandatory accounting standard adoption to renegotiate underlying contracts. In the case of expensing option compensation, non-expensing firms understand that they are over-granting option pay and are unwilling to voluntarily expense options without considering modifications to their option compensation plans to bring the pay-performance relation closer to an optimal level.

Financial publications have reported many examples of firms modifying option compensation plans in anticipation of mandatory option expensing. For example, on December 12, 2004, *The Wall Street Journal* reported that firms are using several strategies to modify option compensation plans, including capping gains from exercising stock options, replacing option grants with shares of restricted stock, and reducing the time to expiration of options from 10 years to as few as 6 years.

4.5 Discussion

In this essay, economic determinants of executive stock option grants are evaluated, controlling for potential differences in granting practices for expensing and non-expensing firms. The results of the analysis indicate that option grants increase as firms have less available cash, more growth opportunities, and low marginal tax rates. Increasing levels of stock ownership, leverage, and high marginal tax rates lead to grants of fewer options. Stock option grants appear to serve as a motivation tool for firms experiencing declining performance as measured by change in return on assets. For these factors, there is no difference in option grant practices between expensing and non-expensing firms. However, the value of the portfolio of in-the-money grants has opposing effects for expensing and non-expensing firms. Theory suggests that as

existing portfolio of stock options increases, incentives provided by additional option grants diminishes. Accordingly, new stock option grants to executives should be inversely related to the value of the existing option portfolio. For expensing firms, this condition exists. As the value of the executive's stock option portfolio increases, new option grants decrease. The opposite is true for non-expensing firms: increasing value of option portfolio leads to increased grants of new stock options. This suggests that non-expensing firms may be over-granting option compensation to their executives.

The residuals from the economic determinant model are used in a logistic regression model that evaluates factors influencing the decision to expense stock option pay. Positive residuals indicate the firm is granting options in excess of the optimal level. If the decision to expense stock option pay is a signal to the market that the firm is of superior quality, then firms granting option compensation in excess of the optimal level would be unable or unwilling to increase the transparency of their stock option program by recognizing this compensation expense. Therefore, in the logistic regression model, the coefficient on the economic determinant residual should be negative, confirming that option compensation plans that award excessive pay reduces the likelihood of expensing option pay. Indeed, this is the result in the logistic regression model. Firms that over-grant option pay are less likely to voluntarily expense option pay.

Accounting choice theory has shown that firms often use the window between accounting guideline issuance and mandatory implementation date to renegotiate underlying contracts to reduce the negative impact of the accounting change. Financial

publications have substantiated this belief that firms have modified compensation contracts prior to the mandatory compliance date for FAS123.

CHAPTER 5

CONCLUSION

In the summer of 2002, accounting guidelines allowed firms the choice of recognizing option compensation as a charge against earnings or disclosing the option cost in financial statement footnotes. Up until this time, almost all firms elected to disclose option compensation data rather than recognize the amount as part of the firm's compensation cost. After the scandals in the early 2000s, where executives in several firms extracted huge profits from stock options prior to revealing accounting irregularities and fraudulent activities, investors and regulators began to question option accounting practices. Perhaps in anticipation of a change in regulation, 151 firms announced they would begin to recognize stock option compensation as an expense against earnings. The majority of publicly traded firms were either silent on the issue or were openly opposed to such action. Clearly expensing option compensation is an income-decreasing choice. This thesis examines the factors that contribute to some firms making the choice to recognize option pay as well as reasons other firms were reluctant to make the same choice.

Accounting choice research finds that firms select among equally acceptable accounting methods and select guideline adoption timing based on efficient contracting, earnings management, and information signaling objectives. Efficient contracting

theory suggests that firms make accounting choices to reduce political exposure and to reduce potential debt covenant violations. Earnings management premise considers the impact of the accounting choice on the firm's current and future earnings and the repercussions the choice may have on management pay tied to earnings objectives. Finally, the information-signaling hypothesis looks at accounting choices as a way for management to reveal private information they hold about the future prospects of the firm.

The decision to expense stock option pay is a choice of equally acceptable accounting alternatives as well as an anticipatory decision on adoption timing. In the first analysis, variables associated with efficient contracting, earnings management, and information signaling are used to determine if they distinguish between expensing and non-expensing firms. The subsequent essays examine the information signaling aspect of accounting choice to determine if expensing firms use the expensing decision to signal they are higher quality firms. Higher quality firms are those firms that use option compensation effectively.

Using logistic regression to distinguish between expensing and non-expensing firms, the decision to expense option pay is influenced by efficient contracting, earnings management, and information signaling criteria. Firms electing to expense option pay are larger and more levered firms. Larger firms have greater political exposure from external sources and reduce this exposure by making accounting decisions that reduce reported earnings. Highly levered firms lessen the chance of debt covenant violation through accounting choices. Option expensing is an income-reducing transaction that

also increases owners' equity section of the balance sheet. Thus, the decision to expense reduces political exposure and the potential to violate debt covenants based on balance sheet data.

Firms that elected to voluntarily expense option pay have greater earnings, making it easier to accommodate the additional cost. Expensing firms also use less option pay for firm executives, have option compensation more concentrated at the executive level rather than broadly used throughout the organization, and grant less bonus compensation to their executives. These results support the earnings management theory of accounting choice: firms that have greater earnings and less impact to earnings from a particular accounting alternative are more likely to adopt an income-decreasing alternative.

From an information signaling perspective, the results on insider ownership variable suggests that the decision to expense is used by high quality firms with more favorable prospects. Greater insider ownership of the firm's stock signals management's belief that the firm anticipates future financial strength. Firm management with favorable information about the firm's future financial strength choose to expense option pay since they know the firm can easily absorb the increased charge to earnings. The probability that a firm chooses to expense option compensation increases with the proportion of shares held by firm insiders.

To further support the information signaling component of option expensing, the quality of firms are analyzed with respect to the effective use of stock option compensation. High quality firms use option compensation as intended – to align

management and shareholders' interests. Alignment of interests suggests that options encourage management to take actions that increases shareholder wealth by increasing the value of the firm. Accordingly, firms that use option compensation effectively realize greater payoff to the firm from increased earnings, structure option pay to provide incentives to the CEO that better align with shareholder interests, and grant option compensation that does not extract rents from the owners.

Stock option pay should be designed to provide incentives to management to make decisions that increase firm value. Firm value is impacted by the cash flows generated by the firm. Payoffs from stock option compensation consider the relation between operating income and option compensation. Using the model developed by Hanlon et al. (2003), the relation between the executives' option portfolio and operating income is examined for the set of expensing firms and for the set of non-expensing firms. Similar to the Hanlon et al. results, there are diminishing returns to operating income from stock option grants to the firm's top five executives for non-expensing firms. However, for expensing firms, the model shows positive and increasing returns to operating income from option compensation. The difference between expensing and non-expensing firms suggests that expensing firms realize increasing payoff from grants while non-expensing firms see diminishing payoffs. If the increasing payoff from option grants for expensing firms indicates effective use of options, then the decision to expense option pay is an indicator of superior firm quality. For the non-expensing firms, the diminishing return from option grants suggests the firms are over-granting

option pay. The decision to expense option pay exposes the ineffectiveness of this incentive pay.

The incentive value of option pay for the firm's CEO motivates the executive to take actions that increase firm value, which increases shareholder and executive wealth. Effective option compensation plans are structured to achieve strong alignment of management and shareholders' interests. High quality firms employ option plans that maintain strong alignment. Theoretically and empirically tested variables are used to measure relation between pay-performance sensitivity of CEO option pay and factors affecting incentive value of option pay, considering possible differences between expensing firms and non-expensing firms. Consistent with previous research, incentive sensitivity of CEO option compensation increases with firm size and growth opportunities and decreases in CEO stock ownership for both expensing and non-expensing firms. Leverage is expected to be negatively related to incentive sensitivity. This result holds only for expensing firms. If the compensation to CEOs motivates them to take excessive risks, debt holders require increased returns since the potential for risk shifting from shareholders exists. By lowering the pay-performance sensitivity of option pay, the firm reduces the demands from the debt holders. Shareholders benefit because the firm does not have to pay higher returns to creditors. Thus, expensing firms' incentive pay to their CEOs is better aligned than CEO option pay in non-expensing firms. From a signaling perspective, the expensing firms provide better alignment of executive and shareholder interests - an attribute of high quality firms.

A model of the economic determinants of option grants is analyzed to determine if differences in option granting practices between expensing and non-expensing firms contribute to the decision to voluntarily expense option pay. The model of economic determinants of option compensation uses firm and executive characteristics that have been shown to influence the level of option grant awards and controls for differences in granting practices between expensing and non-expensing firms. The results are generally as expected and are similar for expensing and non-expensing firms with one interesting exception. Theory suggests that the level of option grants is inversely related to the existing portfolio of options held by the executive. As the option portfolio of the executive increases, the incentive value of additional option grants diminishes. For expensing firms, this relation holds. However, for non-expensing firms, the relation between the existing portfolio of option grants and the level of new options awarded is positively correlated. The more options the executive has, the more options he receives.

The residuals from the economic determinant model are used as an explanatory variable in the logistic regression model examining the decision to expense stock option compensation. Positive residuals suggest the firm is over-granting option compensation, perhaps to the detriment of the shareholders. If the decision to grant option compensation is used to signal high quality firms and if a positive residual signals the firm uses option compensation to extract rents from shareholders, then firms that over-grant option compensation would be less likely to voluntarily expense option pay. The results of the logistic regression model support this hypothesis. If a firm

grants option compensation in excess of the predicted level, then it is less likely to participate in the decision to expense stock option pay.

The implication that firms that over grant option pay are less likely to expense option compensation is consistent with the finding that non-expensing firms experience diminishing returns to option grants, whereas expensing firms realize a linearly increasing relation between option pay and operating income. The decreasing relation between option grants and operating income for non-expensing firms can be a consequence from over-granting option pay. From an information signaling perspective, non-expensing firms are lower quality firms with respect to their inefficient use of option compensation.

The decision to expense option compensation ahead of a mandate by FASB is rooted in the firms' objectives of efficient contracting, earnings management, and information signaling. Expensing firms benefit by the voluntarily expensing through lessening of political costs and potential debt covenant violations. Furthermore, these firms are better able to accommodate the charge against earnings since they have greater earnings and lower option expense. Moreover, expensing firms use the decision to recognize option pay as a way to indicate their superior quality as evidenced by greater future earnings prospects, larger payoffs from option compensation, better incentive alignment of CEO pay and shareholder interests, and effective grants of option pay. Non-expensing firms appear to be unable to mimic the expensing decision since they will have greater impact to earnings and their excessive use of option compensation results in suboptimal payoffs to the shareholders.

APPENDIX A

MEASUREMENT OF OPTION INCENTIVE VALUE

Following the methodology of Core and Guay (1999), the option incentive for the CEO's portfolio is estimated by summing the deltas of each option grant in the portfolio and multiplying the summation by 1% of the fiscal year-end stock price. The delta of an option grant is calculated as

$$\frac{\partial(\text{option value})}{\partial(\text{stock price})} = e^{-dT}N(Z), \quad \text{where:}$$

$Z = [\log(S/X) + T(r - d + \sigma^2/2)]/(\sigma T^{(1/2)})$,

$N(Z)$ = cumulative probability function for normal distribution,

S = stock price at end of fiscal year,

X = strike price of option,

T = time-to-maturity of the option in years,

d = expected dividend yield

σ^2 = expected stock-return volatility over life of the option

Estimating the sensitivity of the CEO's stock option portfolio follows the methodology described in Appendix A of Core and Guay (1999). For current year option grants the sensitivity is calculated as follows:

a. Obtain data on most recent year's option grants, including the number of options, the exercise price, and the time to maturity from ExecuComp.

b. Calculate the dividend yield using current year dividend and beginning of year stock price. Dividend yield is calculated as ln(1+dividend per share).

c. Compute the volatility of stock returns as the standard deviation of daily stock returns over 120 trading days preceding the end of the fiscal year in which grant was made.

d. Obtain the Treasury note rate for a 7-year term.[14]

e. Compute the Black-Scholes sensitivity to fiscal year-end stock price.

f. Calculate the incentive value of the current year's option grants as follows;

Current year incentive value =

Black-Scholes sensitivity x 1% of the fiscal year end stock price x number of shares underlying option grant

The exact composition and detail about the executive's option portfolio is not known or knowable. However, ExecuComp does report the intrinsic value and number of shares underlying the current holdings of in-the-money options. The method for calculating the sensitivity of these options is described below.

a. Obtain data on the portfolio of exercisable and unexercisable stock options, including the intrinsic value and the number of shares underlying the grants.

b. Reduce the quantity and value of the unexercisable grants by the current year's grant. If the number of options in the current year's grant exceeds the number of unexercisable grants, the number of unexercisable grants is reduced to 0 and the exercisable option quantity is reduced by the excess amount.

[14] ExecuComp uses the rate on a 7 year Treasury note as the risk-free rate, recognizing that executives exercise options 70% of the way into the option's 10-year term. The 7-year Treasury rates used are 1998: 4.73%, 1999: 6.55%, 2000: 5.16%, 2001: 4.84%

c. The average exercise price of the exercisable and unexercisable grants is calculated by dividing the value of the grants by the number of underlying shares and subtracting this value from the fiscal year-end stock price.

d. The time to maturity of the unexercisable grants is set equal to 1 year less than the time-to-maturity of the current year grants. The time to maturity of the exercisable grants is 3 years less than the time to maturity of the unexercisable options.

e. Dividend yield, stock return variance, and risk-free rate are measures as described above.

f. Compute the Black-Scholes sensitivity to fiscal year-end stock price.

g. Calculate the incentive value of the portfolio of option grants as follows;

Exercisable option incentive value =

Black-Scholes sensitivity x 1% of the fiscal year end stock price x number of shares underlying exercisable option grants

Unexercisable option incentive value =

Black-Scholes sensitivity x 1% of the fiscal year end stock price x number of shares underlying unexercisable option grants

Total incentive value of options =

Current year incentive value + exercisable option incentive value + nonexercisable option incentive value.

REFERENCES

Aboody, David; Mary E. Barth; and Ron Kasznik; 2004a. SFAS No. 123 stock-based compensation expense and equity market values. The Accounting Review 79: 251 – 275.

Aboody, David; Mary E. Barth; and Ron Kasznik; 2004b. Firms' voluntary recognition of stock-based compensation expense. Journal of Accounting Research 42: 123 – 150.

Abowd, John M. and David S. Kaplan; 1999. Executive compensation: six questions that need answering. The Journal of Economic Perspectives 13: 145 – 168.

Amir, Eli and Amir Ziv; 1997a. Recognition, disclosure, or delay: timing the adoption of SFAS No. 106. Journal of Accounting Research 35: 61 – 81.

Amir, Eli and Amir Ziv; 1997b. Economic consequences of alternative adoption rules for new accounting standards. Contemporary Accounting Research 14: 543 – 568.

Amir, Eli and Joshua Livnat; 1993. Multiperiod analysis of adoption motives: the case of SFAS No. 106. The Accounting Review 71: 539 – 553.

Ayres, Frances L.; 1986. Characteristics of firms electing early adoption of SFAS 52. Journal of Accounting and Economics 8: 143 – 158.

Bagnani, Elizabeth Strock; Nikolaos T. Milonas; Anthony Saunders, and Nickolaos G. Travlos; 1994. Managers, owners, and the pricing of risky debt: an empirical analysis. Journal of Finance 49: 453 – 477.

Baker, George P. and Brian J. Hall; 1998. CEO incentives and firm size. NBER w6868.

Balsam, Steven; 2002. An introduction to executive compensation. Academic Press, London.

Barth, M., Greg Clinch and Toshi Shibano; 2003. Market effects of recognition and disclosure. Journal of Accounting Research 41: 581– 609.

Bebchuk, Lucian Arye and Jesse M. Fried; 2003. Executive compensation as an agency problem. Journal of Economic Perspectives 17: 71 – 92.

Bhattacharya, Sudipto; 1979. Imperfect information, dividend policy, and "the bird in the hand" fallacy. The Bell Journal of Economics 10: 259 – 270.

Bizjak, John M., James A. Brickley, and Jeffrey L. Coles; 1993. Stock-based incentive compensation and investment behavior. Journal of Accounting and Economics 16: 349 – 372.

Black, Fisher and Myron Scholes; 1973. The pricing of options and corporate liabilities. Journal of Political Economy 81: 637 – 654.

Blazenko, George W.; 1987. Managerial preference, asymmetric information, and financial structure. The Journal of Finance 42: 839 – 862.

Bryan, Stephen; LeeSeok Hwang, and Steven Lilien; 2000. CEO stock-based compensation: an empirical analysis of incentive-intensity, relative mix, and economic determinants. Journal of Business 73: 661 – 693.

Chung, Kee H. and Stephen W. Pruitt; 1994. A simple approximation of Tobin's q. Financial Management 23: 70 – 74.

Core, John and Wayne Guay; 1999. The use of equity grants to manage optimal equity incentive levels. Journal of Accounting and Economics 28: 151 – 184.

Core, John and Wayne Guay; 2001. Stock option plans for non-executive employees. Journal of Financial Economics 61: 253 – 287.

Core, John E., Wayne Guay, and David F. Larcker; 2003. Executive equity compensation and incentives: a survey. FRNBY Economic Policy Review.

Core, John E.; Robert W. Holthausen, and David F. Larcker; 1999. Corporate governance, chief executive officer compensation, and firm performance. Journal of Financial Economics 51: 371 – 406.

Corporate Directory of U.S. Public Companies, The. Walker's Research, LLC.: San Mateo, Calif., 1999 – 2002.

Daley, Lane A. and Robert L. Vigeland; 1983. The effects of debt covenants and political costs on the choice of accounting methods: the case of accounting for R&D costs. Journal of Accounting and Economics 5: 195 – 211.

Dechow, Patricia M., Amy P. Hutton, and Richard G. Sloan; 1996. Economic consequences of accounting for stock-based compensation. Journal of Accounting Research 34: 1 – 20.

DeFond, Mark L. and James Jiambalvo; 1994. Debt covenant violation and manipulation of accruals. Journal of Accounting and Economics 17: 145 – 176.

DeFusco, Richard A.; Robert R. Johnson; and Thomas S. Zorn; 1990. The effect of executive stock option plans on stockholders and bondholders. The Journal of Finance 45: 617 – 627.

Dhaliwal, Dan S.; 1980. The effect of the firm's capital structure on the choice of accounting methods. The Accounting Review 55: 78 – 84.

Dhaliwal, Dan S.; Gerald L. Salamon; and E. Dan Smith; 1982. The effect of owner versus management control on the choice of accounting methods. Journal of Accounting and Economics 4: 41 – 53.

Diamond, Douglas W.; 1993. Seniority and maturity of debt contracts. Journal of Financial Economics 33: 341 – 368.

Duke, Joanne C. and Herbert G. Hunt III; 1990. An empirical examination of debt covenant restrictions and accounting-related debt proxies. Journal of Accounting and Economics 12: 45 – 63.

Easterbrook, Frank H.; 1984. Two agency-cost explanations of dividends. The American Economic Review 74: 650 – 659.

Eaton, Jonathan and Harvey S. Rosen; 1983. Agency, delayed compensation, and the structure of executive remuneration. The Journal of Finance 38: 1489 – 1505.

Engel, Ellen; Rachel M. Hayes, and Xue Want; 2003. CEO turnover and properties of accounting information. Journal of Accounting and Economics 36: 197 – 226.

Espahbodi, H., P. Espahbodi, Z. Rezaee and H. Tehranian; 2002. Stock price reaction and value relevance of recognition versus disclosure: The case of stock-based compensation. Journal of Accounting and Economics 33: 343 – 373.

Feltham, Gerald A., and Jim Xie; 1994. Performance measure congruity and diversity in multi-task principal/agent relations. The Accounting Review 69: 429 – 453.

Fenn, George W. and Nellie Liang; 2001. Corporate payout policy and managerial stock incentives. Journal of Financial Economics 60: 45 – 72.

Fields, Thomas D.; Thomas Z. Lys; and Linda Vincent; 2001. Empirical research on accounting choice. Journal of Accounting and Economics 31: 255 – 307.

Frye, Melissa; 2004. Equity-based compensation for employees: firm performance and determinants. Journal of Financial Research 27: 31 – 54.

Gaver, Jennifer J. and Kenneth M. Gaver; 1995. Compensation policy and the investment opportunity set. Financial Management 24: 19 – 32.

Hagerman, Robert L. and Mark E. Zmijewski; 1979. Some economic determinants of accounting policy choice. Journal of Accounting and Economics 1: 141 – 161.

Hall, Brian J. and Jeffery B. Liebman; 1998. Are CEOs really paid like bureaucrats? The Quarterly Journal of Economics 113: 653 – 691.

Hall, Brian J. and Jeffrey B. Liebman; 2000. The taxation of executive compensation. NBER w7596.

Hand, John R.M. and Terrance R. Skantz; 1998. The economic determinants of accounting choices: the unique case of equity carve-outs under SAB 51. Journal of Accounting and Economics 24: 175 – 203.

Hanlon, Michele; Shivaram Rajgopal; and Terry Shevlin; 2003. Are executive stock options associated with future earnings? Journal of Accounting and Economics 36: 3 – 43.

Healy, Paul M. and Krishna G. Palepu; 1993. The effect of firms' financial disclosure strategies on stock price. Accounting Horizons 7: 1 – 11.

Heyes, Anthony G.; 2005. A signaling motive for self-regulation in the shadow of coercion. Journal of Economics and Business 57: 238 – 246.

Himmelberg, Charles P., R. Glenn Hubbard, and Darius Palia; 1999. Understanding the determinants of managerial ownership and the link between ownership and performance. Journal of Financial Economics 53: 353 – 384.

Holthausen, Robert W. and Richard W. Leftwich; 1983. The economic consequences of accounting choice: implications of costly contracting and monitoring. Journal of Accounting and Economics 5: 77 – 117.

Ittner, Christopher D., Richard A. Lambert, and David F. Larcker; 2003. The structure and performance consequences of equity grants to employees of new economy firms. Journal of Accounting and Economics 34: 89 – 127.

Ittner, Christopher D. and David F. Larcker; 2001. Assessing empirical research in managerial accounting: a value-based management perspective. Journal of Accounting and Economics 32: 349 – 410.

Jensen, Michael C. and William H. Meckling; 1976. Theory of the firm: managerial behavior, agency costs and ownership structure. Journal of Financial Economics 3: 305 – 360.

John, Kose and Joseph Williams; 1985. Dividends, dilution, and taxes: a signalling equilibrium. The Journal of Finance 40: 1053 – 1070.

John, Teresa and Kose John; 1993. Top-management compensation and capital structure. The Journal of Finance 48: 949 – 974.

Kedia, Simi and Abon Mozumdar; 2002. Performance impact of employee stock options. Working paper, Harvard University and Virginia Tech.

Kole, Stacey R.; 1997. The complexity of compensation contracts. Journal of Financial Economics 43: 79 – 104.

Lambert, Richard A. and David F. Larcker; 1987. An analysis of the use of accounting and market measures of performance in executive compensation contracts. Journal of Accounting Research 25: 85 – 125.

Langer, Russell and Baruch Lev; 1993. The FASB's policy of extended adoption for new standards: an examination of FAS No. 87. The Accounting Review 68: 515 – 533.

Leland, Hayne E. and David H. Pyle; 1977. Informational Asymmetries, Financial Structure, and Financial Intermediation. Journal of Finance 32: 371 – 387.

Leuz, C. and R. E. Verrecchia; 2000. The economic consequences of increased disclosure. Journal of Accounting Research 38: 91 – 124.

Lewellen, Wilbur; Claudio Loderer, and Kenneth Martin; 1987. Executive compensation and executive incentive problems, an empirical analysis. Journal of Accounting and Economics 9: 287 – 310.

Lilien, Steven and Victor Pastena; 1982. Determinants of intramethod choice in the oil and gas industry. Journal of Accounting and Economics 4: 145 – 170.

Matsunaga, Steven R.; 1995. The effects of financial reporting costs on the use of employee stock options. The Accounting Review 70: 1 – 26.

Mehran, Hamid; 1995. Executive compensation structure, ownership, and firm performance. Journal of Financial Economics 38: 163 – 184.

Miller, Merton H. and Franco Modigliani; 1961. Dividend policy, growth, and the valuation of shares. Journal of Business 34: 411 – 433.

Miller, Merton H. and Kevin Rock; 1985. Dividend policy under asymmetric information. The Journal of Finance 40: 1031 – 1051.

Meulbroek, Lisa; 2001. The efficiency of equity-linked compensation: understanding the full cost of awarding executive stock options. Financial Management 30: 5 – 30.

Murphy, Kevin J.; 1985. Corporate performance and managerial remuneration, an empirical analysis. Journal of Accounting and Economics 7: 11 – 42.

Murphy, Kevin J.; 1999. Executive Compensation. Handbook of Labor Economics, Volume 3. Elsevier Science.

Murphy, Kevin J.; 2003. Stock-based pay in new economy firms. Journal of Accounting and Economics 34: 129 – 147.

Narayanan, M. P.; 1988. Debt versus equity under asymmetric information. Journal of Financial and Qualitative Analysis 23: 39 – 51.

Noe, Thomas H.; 1988. Capital structure and signaling game equilibria. The Review of Financial Studies 1: 331 – 355.

Perry, Tod and Marc Zenner; 2001. Pay for performance? Government regulation and the structure of compensation contracts. Journal of Financial Economics 62: 453 – 488.

Press, Eric G. and Joseph B. Weintrop; 1990. Accounting-based constraints in public and private debt agreements. Journal of Accounting and Economics 12: 65 – 95.

Ragjopal, Shivaram and Terry Shevlin; 2002. Empirical evidence on the relation between stock option compensation and risk taking. Journal of Accounting and Economics 33: 145 – 171.

Ravid, S. Abraham and Ohed H. Sarig; 1991. Financial signalling by committing to cash outflows. Journal of Financial and Quantitative Analysis 26: 165 – 180.

Ross, Stephen A.; 1977. The determination of financial structure: the incentive-signalling approach. Bell Journal of Economics 8: 23 – 40.

Scott, Thomas W.; 1991. Pension disclosures under SFAS No. 87: theory and evidence. Contemporary Accounting Research 8: 62 – 81.

Smith, Clifford W., Jr.; 1993. A perspective on accounting-based debt covenant violations. The Accounting Review 68: 289 – 303.

Smith, Clifford W., Jr. and Ross L. Watts; 1992. The investment opportunity set and corporate financing, dividend, and compensation policies. Journal of Financial Economics 32: 263 – 292.

Sweeney, Amy Patricia; 1994. Debt-covenant violations and managers' accounting response. Journal of Accounting and Economics 17: 281 – 308.

Tian, Yisong S.; 2004. Too much of a good incentive? The case of executive stock options. Journal of Banking & Finance 28: 1225 – 1245.

White, Halbert; 1980. A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. Econometrica 48: 817 – 838.

Yermack, David; 1995. Do corporations award CEO stock options effectively? Journal of Financial Economics 39: 237 – 269.

Yermack, David; 1998. Companies' modest claims about the value of CEO stock option awards. Review of Quantitative Finance and Accounting 10: 207 – 226.

Zmijewski, Mark E. and Robert L. Hagerman; 1981. An accounting strategy approach to the positive theory of accounting standard setting/choice. Journal of Accounting and Economics 3: 129 – 149.

BIOGRAPHICAL INFORMATION

The author is a graduate of Auburn University (War Eagle!) with a bachelor degree in Industrial Engineering. After earning her bachelor degree, she spent 18 years working as an engineer for various companies, including Owen-Corning Fiberglas, Arthur Young, UCCEL, Computer Associates, Chrysler Technologies Airborne Systems, and Allergan. While employed at Allergan, she earned her Masters of Business Administration degree from the Executive MBA program at Baylor University. Upon completion of the MBA program, the author began teaching at Baylor as a Lecturer in Economics and Finance. After moving to the Dallas-Fort Worth metroplex in 2001, she began teaching as an adjunct professor at TCU while pursuing her doctorate degree. She is currently Assistant Professor of Professional Practice in Finance at TCU.