1-19-2011

The Role of Accounting in the Use of Employee Options

Hemang Desai
Southern Methodist University

Zining Li
Southern Methodist University

Suning Zhang
George Mason University

The Role of Accounting in the Use of Employee Options

Hemang Desai
Edwin L. Cox School of Business
Southern Methodist University
(214) 768-3185
hdesai@smu.edu

Zining Li
Edwin L. Cox School of Business
Southern Methodist University
(214) 768-9293
zli@smu.edu

and

Suning Zhang
Department of Accounting
School of Management
George Mason University
(703) 993-1804
szhang4@gmu.edu

January 19, 2011

We acknowledge helpful comments from two anonymous referees, Mark Bradshaw, Ed Joyce, Swami Kalpathy, Anup Srivastava, Mary Stanford, Wayne Thomas (Editor), Ram Venkataraman, and seminar participants at the 2010 AAA Annual Meetings, 2010 CAPANA Conference, SMU, TCU, UTD and the University of Tennessee. We thank Simi Kedia and Shiva Rajgopal for sharing their Unemployment Data for Metropolitan Statistical Areas. We thank Preeti Chaudhary, Shiva Rajgopal, and Mohan Venkatachalam for sharing the sample of firms that voluntarily adopted expensing employee options before 2005.

The Role of Accounting in the Use of Employee Options

Abstract

The determinants of the dramatic increase in the use of employee stock options in the 1990s and the subsequent decline in their popularity have been the subject of intense debate. Some have argued and found evidence to support that the discretion granted to firms to avoid recognizing the fair value of options as an expense led to their overuse for employee compensation. Others have argued and found evidence that the market "sees through" the accounting treatment for options and values firms as though options were expensed at fair value, regardless of financial statement treatment. We revisit this issue with the benefit of post-SFAS 123R data and the addition of controls for key economic and labor market factors that prior research has shown to influence option grants. Our analysis focuses on non-executive options, as such grants comprise almost 90% of employee option grants. We follow Carter et al. (2007) in measuring firm-level propensity to avoid expense recognition (financial reporting concerns). We do not find an association between financial reporting concerns and employee option grants after controlling for the relevant economic/labor market factors. Our analysis of change in option use over 1995-2007 shows that changes in option grants are associated with corresponding changes in economic determinants. Finally an examination of change in option use subsequent to the mandatory adoption of SFAS 123R shows that firms with a higher level of reporting concerns prior to adoption experienced a comparable reduction in options relative to firms with a lower level of reporting concerns. Overall, the results suggest that the role of accounting in influencing employee option grants has likely been overstated, and the dead-weight economic costs from overuse of options appear to be less than widely perceived.

I. Introduction

The use of stock options in compensation contracts increased dramatically in the 1990s, peaking in 2000 and steadily declining thereafter. The determinants of this trend have been the subject of considerable debate both within and among academics, politicians, practitioners, and regulators. It has been suggested that the accounting treatment of options has played a significant role in this trend as prior to the issuance of SFAS 123R in 2005, firms were not requied to expense fair value of options. Hall and Murphy (2003) argue that this favorable accounting treatment of options led firms to underestimate the true economic cost of options, leading executives and the Boards to view employee stock options as essentially free since they resulted in neither a cash outlay nor an accounting charge. Thus, an inaccurate "perceived" cost of options led to their overuse and resulted in dead-weight economic costs to the firms' shareholders.

Others have argued that the market takes the fair value of options into account in pricing a firm's stock (e.g., Aboody (1996) and Aboody et al. (2004a)) since the fair value of options is readily accessible. Prior to SFAS 123R, firms that did not expense the fair value of options were nonetheless required to disclose in the footnotes to their financial statements (a) their estimate of the fair value of the options granted in the accounting period; and (b) pro-forma earnings wherein the fair value of these options were expensed. Thus, if the market takes the fair value of employee stock options into account in pricing a firm's stock, then the accounting treatment of employee options should not affect the use of options in compensation contracts. In other words, an economically optimal amount of options-based compensation should not be affected by the accounting treatment.

However, despite the evidence that the stock market takes the fair value of options into account in pricing a firm's stock, the extant research suggests that firms' option granting decisions appear to be influenced by the accounting treatment of options. For example, Carter, Lynch and Tuna (2007) find that firms' financial reporting concerns are positively (negatively) associated with the use of options (restricted stock) in CEO compensation contracts over the period 1995-2001. In addition, they find that firms reduce the use of options and increase the use of restricted stock after deciding to voluntarily expense options in 2002 or 2003. In another recent paper, Brown and Lee (2007) examine the change in executive option grants around the issuance of SFAS 123R and find that the reduction in options granted to top executives is related to the extent to which firms relied on the favorable treatment of stock options to meet their financial reporting objectives. An important implication from the above studies is that the favorable accounting treatment of employee options contributed to overweighting of options in the compensation contracts prior to the issuance of SFAS 123R resulting in dead-weight economic costs on the firms.

However, the inference from the above studies is subject to two important caveats. First, neither Carter et al. (2007) nor Brown and Lee (2007) examine option grants to non-executive employees or total options granted by a firm. However, non-executive option grants account for almost 90% of the options granted by firms in the Execucomp sample. If option grants are motivated by accounting considerations, then a positive association is expected between total option grants and financial reporting concerns, and not just a positive association between CEO options and financial reporting concerns. Second and perhaps more importantly, in relating option grants to financial reporting concerns, the above studies do not control for some of the key economic and labor market determinants of employee options that

have been shown by recent work to influence option grants. For example, recent research in financial economics has shown that economic and labor market considerations such as employee sentiment, employee retention, attracting optimistic employees and the tightness of labor markets explain the significant increase in option grants during the 1990s (Mehran and Tracy, 2001; Oyer and Schaefer, 2005; Bergman and Jenter, 2007; Kedia and Rajgopal, 2009). The omission of these known determinants of employee options raises the possibility of inference from prior research that favorable accounting treatment resulted in overweighting of options in compensation plans is affected by omitted variables. As a result, prior work may have overestimated the importance of accounting in influencing employee option grants.

The above discussion suggests that the issue of whether accounting treatment affects the use of employee options continues to remain an open and controversial issue. In their survey article, Core, Guay and Larcker (2003) state that the role of financial reporting for employee options is important, but one that is not well understood by economists. Thus, they call for additional research "to examine the role of accounting in motivating firms to either increase or decrease the use of stock options." In this paper, we follow the call for additional research on this issue and extend the literature in several ways. First, we examine the non-executive option grants, which constitute an overwhelming majority of options granted by firms. Second, in our examination of the impact of accounting on the use of employee options, we control for the economic and labor market factors that have been shown by prior research in financial economics to influence the use of employee options. Finally, to directly address the issue of whether mandatory expensing of employee options required by SFAS 123R resulted in a reduction of the use of employee options, we examine the change in employee option grants around the adoption of SFAS 123R, after controlling for the relevant economic

and labor market factors in an attempt to isolate the impact of accounting in influencing the option granting behavior of firms.

Our results over the period 1995-2007 show that economic and labor market considerations such as employee sentiment, attracting optimistic employees (sorting), employee retention and tightness of labor markets are significantly associated with employee option grants. This relation is observed not only in the period prior to SFAS 123R, but also after the adoption of SFAS 123R. Moreover, once these determinants are controlled for, there is no reliable association between proxies of financial reporting costs/concerns and employee option grants in the period prior to SFAS 123R. This result is not consistent with the argument that firms with greater financial reporting concerns granted more options prior to 123R. An analysis of year-to-year change in option grants shows that annual changes in option grants are significantly related to corresponding changes in economic and labor market factors, but there is no reliable association between either the level or the change in financial reporting concerns and the change in option grants. Moreover, the results show that employee option grants declined sharply in 2001 and have been steadily declining ever since. Thus, the decline in option grants started well before the requirement to expense employee options. Finally, an examination of the change in employee option grants specifically around the adoption of SFAS 123R shows that changes in option grants are related to contemporaneous changes in economic factors discussed above, but we do not find evidence that firms with greater financial reporting concerns prior to SFAS 123R reduced option grants more. Overall, our results show that the firms' option granting behavior, both before and after the adoption of SFAS 123R, appears to be better explained by economic and labor market conditions than the accounting treatment of employee options. Our results are comforting, as they suggest that the

economic costs (dead-weight costs) imposed by the accounting treatment of options appear to be far less than what has been widely perceived (Hall and Murphy, 2002; Carter et al., 2007).

We recognize and acknowledge the difficulty in empirically measuring a firm's concern over reported earnings and that our proxies, though borrowed from prior research (Carter et al., 2007), may not fully capture the financial reporting concerns of the firms. Moreover, the research has identified special situations where financial reporting concerns seem to have influenced compensation decisions.[1] As a result, we do not claim that accounting considerations do not influence the design of incentive compensation or other firm decisions. Also, a significant association between economic and labor market determinants and employee options does not rule out the possibility that the favorable accounting treatment resulted in a lower perceived cost of options, and hence, larger option grants. However, at a minimum, our results suggest that the role of financial reporting considerations in motivating employee options appears to be far less than implied by prior research.

The remainder of this paper is organized as follows: the next section provides background information and motivations for this study; section 3 discusses the data, variable measurement, and empirical design; section 4 describes our findings; and section 5 concludes the paper.

II. Background and motivation

The traditional argument in favor of stock options is that option compensation mitigates agency conflicts by better aligning the incentives of the managers with those of the

[1] For example, Carter and Lynch (2003) show that firms accelerated option repricing prior to December 15, 1998, to avoid recognizing the expense associated with the repricing of employee options subsequent to that date. Choudhary et al. (2009) find that firms accelerated the vesting of employee options prior to the effective date of SFAS 123R to avoid recognizing the fair value of options as an expense.

shareholders (Jensen and Meckling, 1976). Other economic considerations influencing the use of options include the presence of growth options, information asymmetry, monitoring costs, liquidity constraints, etc. (Demsetz and Lehn, 1985; Smith and Watts, 1992). While the above factors help explain option grants for executives, almost 90% of the option grants made by firm are made to non-executive or rank-and-file employee. Such broad-based option grants are difficult to reconcile within an incentive/agency framework, as the actions of lower-ranked employees are unlikely to have a direct and significant effect on firm value. In addition, the benefits of increased effort due to option compensation are likely to be offset by the costs of increased risk imposed and incentives to free ride (Oyer 2004). The dramatic growth in non-executive employee options, coupled with the inability to reconcile this growth within an agency/incentive-based framework, has made employee options highly controversial. In order to reconcile this dramatic growth in employee options, the extant literature has offered two (non-mutually exclusive) explanations.

The first explanation for the proliferation of employee options argues that the accounting treatment allowing firms the discretion not to expense the fair value of options provided an accounting subsidy, which reduced the "perceived" cost of employee options relative to their "true economic" costs, at least in the minds of the executives and the Boards (Hall and Murphy (2002, 2003) and Jensen et al. (2004)). This argument implies that firms would prefer granting options if (a) they perceive that the benefits of higher reported earnings outweigh the increased economic costs of options; and (b) firms with higher reporting concerns are likely to grant more options because of larger accounting benefits. Stated differently, it suggests that cross-sectional variation in option grants at a given point in time is related to differences in financial reporting costs/concerns (benefits) across firms.

To examine whether firms with greater financial reporting concerns grant more employee options Carter et al (2007) develop two comprehensive proxies for a firm's financial reporting concerns. They then examine the association between these proxies and CEOs' option and restricted stock grants for a sample of Execucomp firms (S&P 1500) over 1995-2001. Their proxies (explained in detail later) incorporate a multitude of reasons why a firm might perceive expensing fair value of option grants to have significant financial reporting costs. They report a positive association between a firm's financial reporting concerns and the fair value of option grants to CEOs. Based on this finding, they conclude that the favorable accounting treatment of options likely led to the overweighting of options in CEO compensation contracts. Brown and Lee (2007) examined change in stock option grants to the top-five executives subsequent to the issuance of SFAS 123R. They find that the reduction in option grants is greater for firms that have tighter earnings-based debt covenants, or greater incentives to achieve certain earnings benchmarks. Their results suggest that financial reporting considerations caused firms to reduce their option grants subsequent to the issuance of SFAS 123R.

Recent research in financial economics suggests that considerations such as employee sentiment, attracting optimistic employees and labor market factors such as employee retention and tightness of labor markets significantly influence firms' option granting decisions, especially for grants to non-executive employees. When employees have heterogeneous expectations about the prospects of a firm, an option-based compensation plan facilitates sorting by attracting optimistic employees if these employees overvalue stock options. This allows the firm to reduce its compensation cost by selling overvalued equity to employees who attach a high valuation to it. Arya and Mittendorf (2005) also argue that firms

use options to attract optimistic employees from the labor pool. Consistent with the above predictions, several studies show that optimistic employees tend to overvalue their employers' stock and option grants. For example, a survey of middle-level managers and future entry-level managers in Hodge et al. (2009) shows that managers consistently over-value stock options relative to the Black-Scholes value and relative to the value of restricted stock. Benartzi (2001) shows that employers' past performance affects employees' sentiment toward the employer and that employees exhibit a stronger preference for the equity of their employer in their 401 (K) plans if the firm has done well in the past. Using prior firms' returns to proxy for employee sentiment and firm volatility to capture heterogeneity in expectations, prior research has shown that prior returns and firm volatility are positively associated with option grants (Oyer and Schaefer, 2005; Bergman and Jenter, 2007).

The retention hypothesis argues that if an employee's outside opportunities are positively correlated with the firm's (employer's) stock price, then options serve to index the employee's deferred compensation to his or her outside opportunities, thereby serving as a retention mechanism (Oyer, 2004). Thus, the retention hypothesis predicts that option plans will be more common at firms whose returns are more closely related to the returns of other firms that compete for the same set of employees. Following Oyer and Schaefer (2005), we use a firm's share of industry volatility to proxy for the retention benefit of options. Under the assumption that labor markets for rank-and-file employees are geographically segmented, Kedia and Rajgopal (2009) provide evidence consistent with the retention hypothesis. They find that firms whose stock prices co-move more with other firms in the same geographic area tend to grant more options to rank–and-file or non-executive employees. Also, the survey data

reported in Ittner et al. (2003) indicate that employee retention is an important driver of broad-based options grants.

The above discussion suggests that research addressing the impact of the accounting treatment of options on the use of employee options should (a) control for known economic and labor market considerations; and (b) consider non-executive (and total) option grants and not just those to executives. We add to the literature by doing both of these.

III. Data Sources, Variable Definitions, and Research Design

Our sample starts with all firms covered by the ExecuComp database over 1995-2007 and is matched with financial information from Compustat and stock return data from CRSP. The ExecuComp database provides information on annual compensation and equity holdings of the five highest-paid executives for all firms in the S&P 500, S&P MidCap, and S&P SmallCap stock indices starting from 1992. To ensure data availability, we follow Carter et al. (2007) and begin our sample period from 1995.

Our initial sample comprises all 3,066 firms from the ExecuComp database in an unbalanced panel from 1995 to 2007, comprising 23,822 firm-years. We first exclude 1,080 firm-years, for which the standard deviation of our estimates of the number of options granted in a given firm-year was greater than 10% of the mean estimate (Bergman and Jenter, 2007). We also exclude 1,655 firm-year observations, as they lack the information necessary to calculate the per-employee Black-Scholes value of the option grants. We then exclude 284 firms (1,227 firm-years) that adopted option expensing prior to 2005.[2] Finally, we eliminated firm-years in which information on at least one of the variables used in our regression model

[2] The list of firms that began to expense options voluntarily over the period 1995-2004 (prior to SFAS 123R) was obtained from Bear Stearns Equity Research in December 2004. We do not have information on firms that adopted SFAS 123R in 2005 before expensing became mandatory for them. Our results are not sensitive to the exclusion of voluntary or early adopters.

(1) was missing. The final data set used in our base regression comprises 2,207 firms and 13,021 firm-years.

Estimating the value of employee option grants

We follow Bergman and Jenter (2007) with some modifications in estimating the value of total employee option grants. We first estimate the number of option grants a firm made to its employees in a year. Compustat provides such information (variable OPTGR) for most of our firms starting in 2004. We therefore use OPTGR when it is available on Compustat. For those firm-years where OPTGR is not available, we take the number of options granted to an executive (variable "numsecur") from ExecuComp and divide it by its percentage of the total number of options granted in that year (variable "pcttotopt"). Following Bergman and Jenter (2007) we delete all firm-years in which the sample standard deviation of the estimates is greater than 10% of the mean. If the estimate of number of total options is smaller than the number of options grants to the top five executives, we set the number of total options equal to the number of options to top five executives.[3]

Subtracting grants made to the top-five executives from the total option grants, we obtain the number of option grants to non-executive employees. The per-share value of option grants is estimated using the modified Black-Scholes model, which accounts for dividend payouts (Merton, 1973). The model inputs include the stock price at the grant date, the option exercise price, the expected stock-return volatility, the risk-free interest rate, the time-to-maturity of the option, and the expected dividend yield. We assume that 1/12th of the total number of annual options are granted each month, using the mid-point of the monthly High and Low as the option exercise price (Bergman and Jenter, 2007). The estimates of the

[3] There are 201 firm-years for which the estimate of the number of total option grants was smaller than the option grants to the top-five executives. Our results are similar, and our inference is not affected if we delete these firm-years.

dividend yield and expected stock-return volatility are obtained from ExecuComp for 1995-2006; for year 2007, we use the estimation methodology in ExecuComp and estimate the expected dividend yield as the average of dividend payout over the previous 3 years, and expected stock-return volatility as the average monthly stock-return volatility over the previous 5 years. We set the option maturity uniformly to 7 years and use the 7-year Treasury bill yield as the risk-free rate. Finally, we calculate the per-employee value of options by dividing the Black-Scholes value of options granted to non-executive employees by the average number of employees in a year.[4]

Measures of financial reporting concerns

Prior research has identified circumstances under which particular earnings patterns (e.g., continuously meeting or beating analysts' forecasts and maintaining increasing earnings) have positive capital markets effects. The extant research also documents that firms have extra incentives to maintain higher earnings when raising capital and when bumping up against debt covenants.[5] Since the use of stock options prior to SFAS 123R did not require the recognition of compensation expense, firms concerned about the negative capital market effects of lower earnings may have made greater use of options versus other forms of compensation.

[4] If the number of employees of a firm is missing for a year, we replaced it with the firm's average number of employees for the period between 1995-2007. Our results are similar if we drop firm-years, in which the number of employees is missing.

[5] Prior research has identified a combination of firm characteristics to capture a firm's concerns related to the costs/benefits of financial reporting. For example, prior evidence suggests that firms are under pressure by capital markets to maintain a string of consecutive earnings increases, or to persistently meet or beat analysts' earnings expectations in consecutive quarters (Barth et al., 1999; Bartov et al., 2001; Beatty et al., 2002). The extant evidence also finds that firms engage in manipulations of accounting accruals or real activities in order to achieve higher reported earnings when they are close to violating debt covenants (Dyreng, 2009). Therefore, the accounting and finance literature have employed a combination of firm characteristics in order to capture financial reporting costs/benefits including persistence in meeting or beating analysts' earnings expectations, the frequent occurrence of earnings increases, the imminent need of access to capital markets (equity or debt), and the current interest burden (measured by leverage or the interest coverage ratio). A partial list of studies includes Matsunaga (1995), Yermack (1995) and Bryan et al. (2000).

Based on the above literature, Carter et al. (2007) develop five proxies to encompass the capital market effects of earnings. We adopt their methodology and construct the following variables: (1) *FREQMBE*, the frequency a firm met/beat the quarterly analysts' forecasts over the prior eight quarters; (2) *FREQEPSUP*, the frequency over the prior eight quarters that the quarterly EPS (reported as actual earnings at IBES) was at least as high as that of the same quarter in the prior year; (3) *LEVERAGE (LEV),* the ratio of total debt to total assets calculated at the beginning of a year; (4) *ISSUE_EQ*, the expected sale of new equity capital calculated as the change in common equity from year *t* to *t+1*; (5) *ISSUE_DEBT*, the expected sale of new debt capital calculated as the change in total debt from year *t* to *t+1*.

Following Carter et al. (2007), we run the principal components analysis of these variables to generate aggregate measures of a firm's overall concerns about financial reporting costs. Our analysis yields the same factor loadings as Carter et.al (2007). We also use the two factors with Eigen-values greater than 1 as our measures of financial reporting concerns (FINRPT1, FINRPT2).[6]

Proxy for employee sentiment, sorting, and retention

Our proxies for employee sentiment, sorting (attraction), and retention are based on the recent theoretical and empirical work in financial economics (Oyer (2004), Oyer and Schaefer (2005) and Bergman and Jenter (2007)). Our construction of these proxies follows the above cited work. We measure employee sentiment in year *t* as annualized stock returns calculated from the beginning of year *t*-2 to the end of year *t*-1 using CRSP monthly returns data. Using firm volatility as a proxy for heterogeneity of expectations, the sorting model predicts that high-volatility firms are likely to make more broad-based option grants. We

[6] *FINRPT1*=0.80*FREQEPSUP*+0.81*FREQEPSMBE* -0.51*LEV*.
FINRPT2=0.79*ISSUE_EQ*+0.81*ISSUE_DB*.

measure a firm's stock return volatility (*FIRMVOL*) as the standard variation of monthly stock returns (a minimum of 5 observations is required) in year *t*. The retention hypothesis predicts that option plans will be more common at firms whose returns are more closely related to the returns of other firms that compete for the same set of employees. Thus, we construct *VOLSHR*, a firm's share of industry volatility to proxy for the retention benefit of options. We first run regressions of each firm's monthly returns on its industry returns (three-digit SIC) over a period of 12 months ending the last month of year *t*. A minimum of 12 observations is required for these regressions. We average the R^2 from these regressions of all firms in the same 3-digit SIC industry and define this as a firm's industry volatility share (*VOLSHR*).

Finally, attraction and retention are particularly critical in tight labor markets. To measure local labor market competition, following Kedia and Rajgopal (2009), we construct a variable *UNEMP*, which represents the unemployment rate in each metropolitan statistical area (MSA) where the corporate headquarters are located. We obtain the zip code of the corporate headquarters from Compustat, and obtain the total labor force and unemployment rate at the zip-code level from the U.S. Census Bureau. We then match each zip code to a MSA and obtain information on the total labor force and unemployed labor force at the MSA level by summing up all of the zip codes in each MSA. The MSA unemployment rate is calculated by dividing the unemployed labor force by the total labor force at the MSA level. In our regression analysis, we create a dummy variable *TIGHT*, which equals one if the unemployment rate (*UNEMP*) decreases from year *t-1* to year *t*.

Determinants of annual employee option grants

A firm makes decisions regarding whether to grant options and the amount of options to be granted simultaneously; hence, a Tobit model is perhaps more appropriate than an OLS

model, given the truncated distribution of annual option grants. However, ExecuComp covers mostly firms that make equity grants to employees (only about 5% of our sample has missing or zero equity grants). Therefore, many other studies on employee equity compensation use an OLS regression to model the determinants of option grants (for example, Bergman and Jenter, 2007). Thus, we also estimate an OLS regression. As a robustness test, we replicate our analysis using a Tobit model and our results are similar and the inference remains unchanged. We estimate a single model for the entire period 1995-2007 but include a dummy (POST) that takes the value of 1 for observations after SFAS 123R (2005-2007). We also interact each of the explanatory variables with the POST dummy to examine whether the magnitude of the association changes post-123R. The model specification for stock options grants to non-executive employees is given below.

$$
\begin{aligned}
EMPOPT = {} & \alpha_0 + \alpha_1 POST + \alpha_2 SENTIMENT + \alpha_3 FIRMVOL + \alpha_4 VOLSHR + \alpha_5\, TIGHT \\
& + \alpha_6 FINRPT1 + \alpha_7 FINRPT2 + \alpha_8 NEWECON + \alpha_9 CASHCSTR \\
& + \alpha_{10} DIVYLD + \alpha_{11} EQCSTR + \alpha_{12} BM + \alpha_{13}\, ASSET \\
& + \alpha_{14} RET + \alpha_{15} EARNVOL + \alpha_{16}\, POST*EMPOPT\_PRE + \alpha_{17}\, POST*SENTIMENT + \\
& \alpha_{18} POST*FIRMVOL + \alpha_{19}\, POST*VOLSHR + \alpha_{20} POST*TIGHT + \alpha_{21} \mathrm{POST}*FINRPT \\
& + \alpha_{22} POST*FINRPT2 + \alpha_{23}\, POST*NEWECON + \alpha_{23}\, POST*CASHCSTR \\
& + \alpha_{24} POST*DIVYLD + \alpha_{25}\, POST*EQCSTR + \alpha_{26}\, POST*BM + \alpha_{27}\, POST*ASSET \\
& + \alpha_{28} POST*RET + \alpha_{29}\, POST*EARNVOL + \alpha_{30}\, POST*EMPOPT\_PRE + \varepsilon
\end{aligned}
\qquad (1)
$$

The dependent variable is the natural logarithm transformation of the per-employee Black-Scholes value of the annual options ($000) granted by a firm to non-executive employees. We define non-executive employees as all employees, excluding the top-five executives. The association between option grants and attraction and retention proxies—*SENTIMENT*,

FIRMVOL, and *VOLSHR* is expected to be positive, since firms are likely to grant more options when the attraction and retention benefits are larger. The coefficient on *TIGHT* is predicted to be positive because a decrease in the unemployment rate (i.e., *TIGHT*=1) is indicative of tighter labor markets, and hence, there is greater pressure on firms to grant more options, *ceteris paribus*. We expect the aforementioned associations to persist, regardless of the accounting treatment of stock options. With respect to financial reporting concerns, if the favorable accounting treatment had motivated firms to overweight option grants prior to SFAS 123R, we would observe a positive correlation between option grants and the proxies for financial reporting concerns during 1995-2004. However, no such association is expected in the 2005-2007 period, as all firms are required to expense options under SFAS 123R.

We control for other economic factors that the prior literature has shown to influence the decision to grant options. Ittner et al. (2003) find that the determinants of equity grants are significantly different in new economy versus old economy firms. Thus, we include a dummy variable *NEWECON*, which equals one if a firm operates in industries such as computers, software, the Internet, telecommunications, or networking.[7] Firms that have a cash shortage are more likely to use equity compensation since equity grants require no cash outlays (Yermack, 1995; Dechow et al., 1996). Consistent with Core and Guay (1999) and Carter et al. (2007), we measure cash constraints (*CASHCSTR*) as the three-year average of [(common and preferred dividends – cash flow from investing – cash flow from operations)/ total assets]. Cash constraints are thus increasing in the magnitude of this variable. Dividends are generally accrued for restricted stock, but not for stock options. Hence firms that pay high dividends are more likely to grant restricted stock and are less likely to grant options, *ceteris paribus*. We

[7] We follow Ittner et al. (2003) and define new economy firms as those with the following four-digit SIC codes: SIC 4812-4899, SIC3820-3869, SIC 2830-2839, SIC 3660-3679, and SIC 7370-7379.

measure the dividend yield (*DIVYLD*) as the three-year average (ending year *t*-1) of the ratio of dividends per share to price per share. Firms are less likely to grant options when they are close to their equity issuance constraint. To measure a firm's proximity to this constraint (*EQCSTR)*, we use the ratio of total shares issued to outstanding shares at the end of year *t-1*.[8]

Firms with higher growth opportunities are likely to grant more options (Smith and Watts, 1992). Following Smith and Watts (1992) and Core and Guay (1999), we use the ratio of the book value of assets to the market value of equity plus debt (*BM*) at the end of year *t* to capture growth opportunities. The prior literature also documents a positive association between firm size and option grants. Therefore, we include the logarithm of the total assets at the end of year *t* (*ASSET*) to control for firm size. Since employee compensation is likely to increase with firm performance, we use the annual stock return (*RET*) of year *t* to control for firm performance. Following Carter et al. (2007) we control for earnings volatility (EARNVOL) and measure it as the square of the standard deviation of ROA (return on assets), where the standard deviation of ROA is calculated over a period of ten years ending year *t*-1 (a minimum of 5 observations is required). Carter et al. (2007) also include the prior year's option grants as an additional control. Although a high correlation between economic determinants and the prior year's stock option grants may cause estimates on other control variables to be insignificant, we include *EMPOPT_PRE* to be consistent with Carter et al (2007).[9] To minimize the influence of outliers, we winsorize all continuous variables at 1% tails.

Change in annual option grants

[8] Ideally we want to use the ratio of issued to authorized shares. However, information on authorized shares is not available.

[9] Some studies on the determinants of employee equity compensation do not include the option grants in the prior year as an explanatory variable (e.g. Core and Guay, 2003; Oyer and Schaefer, 2005). The coefficient estimates on all of our controls are significant with the predicted signs when we exclude previous years' option grants.

We relate the change in option grants to the change in the determinants of employee options over the period 1995-2007. This approach allows each firm to act as its own control, thereby minimizing the concern that our findings are driven by some correlated omitted variables. We first investigate the year-to-year change in annual option grants. We calculate the change from year *t*-1 to *t* for all variables in model (1) except for *TIGHT*, *NEWECON* and *OPT_RRE,* and we estimate the following OLS regression:

$$\Delta EMPOPT = \alpha_0 + \alpha_1 \Delta SENTIMENT + \alpha_2 \Delta FIRMVOL + \alpha_3 \Delta VOLSHR$$

$$+ \alpha_4 TIGHT + \alpha_5 \Delta FINRPT1 + \alpha_6 \Delta FINRPT2 + \alpha_7 NEWECON$$

$$+ \alpha_8 \Delta CASHCSTR + \alpha_9 \Delta DIVYLD + \alpha_{10} \Delta EQCSTR + \alpha_{11} \Delta BM$$

$$+ \alpha_{12} \Delta ASSET + \alpha_{13} \Delta RET + \alpha_{14} \Delta EARNVOL + \text{year dummies} + \varepsilon \qquad (2)$$

To infer the trend in annual option grants over the sample period, we include a dummy variable for each year over 1995-2007, except for year 2000. Thus, the intercept represents the change from 1999 to 2000, which cannot be explained by economic determinants, proxies for financial reporting concerns, or other controls. The year dummies represent the difference in the change in options relative to the change from 1999 to 2000. We also include *NEWECO,* since firms in those industries rely more on option compensation in attracting and retaining employees but we do not have a prediction on the coefficient.

We further examine the change in option grants around mandatory adoption of SFAS 123R to test whether mandatory expensing of options resulted in reduced option grants. We calculate the change around mandatory adoption as the difference in the mean option grants over 2005-2007 and the mean over 2002-2004 (the 3-year average), and as an alternative

measure, the difference in the mean over 2005-2006 and the mean over 2003-2004 (the 2-year average).

$$\begin{aligned}
&\text{CSTRCHG123R_}\textit{EMPOPT} \\
&= \alpha_0 + \alpha_1 \text{CHG123R_}\textit{SENTIMENT} + \alpha_2 \text{ CHG123R_}\textit{FIRMVOL} \\
&+ \alpha_3 \text{ CHG123R_}\textit{VOLSHR} + \alpha_4 \textit{TIGHT} + \alpha_5 \text{PRE123R_}\textit{FINRPT1} \\
&+ \alpha_6 \text{PRE123R_}\textit{FINRPT2} + \alpha_7 \text{CHG123R_}\textit{CASHCSTR} \\
&+ \alpha_8 \text{CHG123R_}\textit{DIVYLD} + \alpha_9 \text{CHG123R_}\textit{EQCSTR} \\
&+ \alpha_{10} \text{CHG123R_}\textit{BM} + \alpha_{11} \text{CHG123R_}\textit{ASSET} + \alpha_{12} \text{CHG123R_}\textit{RET} \\
&+ \alpha_{13} \text{CHG123R_}\textit{EARNVOL} + \alpha_{14} \textit{NEWECON} + \varepsilon \qquad (3)
\end{aligned}$$

IV. Results

Descriptive statistics

Table 1 reports the summary statistics for our sample. Panel A reports the mean annual option grants to non-executive employees, the CEO, the top-five executives, and the total option grants over the sample period of 1995-2007. The statistics show that grants to non-executive employees constitute an overwhelming majority of the total grants, accounting for 85% to 92% of total option grants over our sample period. The time trend in option grants shows that the mean value of option grants, especially to non-executive employees, increased dramatically during the late 1990s and then declined following the crash of the technology bubble in 2000. For example, the mean value of non-executive option grants increased from $39.46 million in 1998 to $115.01 million in 2000. After peaking in 2000, option grants started to decline and experienced a particularly sharp drop in 2002. The mean option grants

to non-executive employees declined from $95.18 million in 2001 to $54.05 million in 2002 and have been steadily declining since. This suggests that the decline in option grants started well before the mandatory expensing requirement. Option grants to the top-five executives also show a similar pattern, peaking in 2000 and declining afterwards, though the decline in option grants for top executives is not as dramatic as the decline in non-executive option grants.

Panel B of Table 1 reports the means of various economic and labor market indicators, and proxies for financial reporting concerns over the sample period. The statistics show that the mean employee sentiment (returns over the prior two years) increased over the late 1990s, and then declined after the crash of the technology bubble. Similarly, firm volatility also increased over the period 1998-2000 and then started to decline afterwards. This trend is consistent with a positive association between non-executive employee option grants, and employee sentiment and firm volatility documented in prior studies (Oyer and Schaefer, 2005; Bergman and Jenter, 2007). The statistics on unemployment rates show that the mean unemployment rate in the MSA region of firms' headquarters declined over the late 1990s and then increased from 3.94% in 2000 to 6.18% by 2003. Thus, the observed trend in employee option grants appears to mirror the corresponding changes in the economic and labor market determinants of employee options.

In contrast, there does not appear to be a discernable pattern over time in the proxies of financial reporting concerns. The mean value of FINRPT1 does not change appreciably over the last 1990s, but does show an increase from 1.40 in 1999 to 1.48 in 2001. The mean of FINRPT1 then declines for two more years before increasing again in 2004. FINRPT2 peaks in 1998 at 0.09, and then declines to 0.06 in 2000, and then increases for 2 years afterwards.

Thus, the time-series changes in proxies for financial reporting concerns do not appear to match the changes in the economic and labor market factors, nor do the time-series pattern changes in employee option grants. However, it should be noted that one of the key predictions of the financial reporting hypothesis is that in the cross-section, firms with financial reporting concerns grant more options. Thus, financial reporting concerns can still explain cross-sectional variation in option grants. Overall, though, the time-series pattern of the summary statistics seems to suggest that changes in option grants over time appear to mirror corresponding changes in the economic and labor market determinants.

Table 2 reports the correlation matrix for the period 1995-2007. The correlations between employee option grants and the proxies for employee sentiment, sorting and retention are positive, while the correlation between option grants and the unemployment rate is negative, consistent with the observed trends reported earlier. The correlation between employee option grants and FINRPT1 (FINRPT 2) is positive. Consistent with prior work, New Economy firms tend to grant more options, and the correlations between employee option grants and other determinants such as cash constraints (CASHCSTR), dividend yield, earnings volatility, BM ratio, etc., are in the predicted directions and are consistent with prior work.

Analysis of annual option grants to employees

We begin our multivariate analysis by first documenting the association between non-executive option grants and proxies for financial reporting concerns, other known determinants of employee option grants and the additional economic/labor-market factors

discussed earlier.[10] This analysis is estimated over the entire sample period 1995-2007, but we include a dummy variable (POST), which takes a value of 1 for observations after the mandatory adoption of SFAS 123R (2005-2007).[11] Thus, the interaction terms test whether the association between the various determinants of options grants changes subsequent to expensing options.[12]

The results of the multivariate analysis are presented in Table 3. We first estimate this regression without the controls for the additional economic and labor-market factors. The results show that consistent with prior research, new economy firms and firms with higher growth opportunities grant more options.[13] Also, consistent with prior research, we find that dividend yield is negatively related to option grants, and firms with a large number of options outstanding (equity-constrained) grant fewer options. With respect to proxies for financial reporting concerns, the coefficient on FINRPT1 is positive and significant (p-value <0.001), and the coefficient on FINRPT2 is negative, but not significant. Note that the financial reporting concerns hypothesis predicts a positive association between financial reporting concerns and option grants. Thus, when we examine non-executive option grants, without some of the relevant economic/labor market factors, we find some evidence to support the conjecture that firms with greater financial reporting concerns granted more options during the period 1995-2004 when firms had the discretion not to expense the fair value of options.

[10] In the interest of brevity, we only report the results of non-executive option grants. However, our results are similar, and the inference is not affected if we analyze total option grants.

[11] Although SFAS 123R became effective as of June 15, 2005, a majority of firms adopted SFAS 123R beginning January 2005, and hence, we treat the period 2005-2007 as the one when all firms were expensing employee options. We replicate our analysis using 2006-2007 as the post-SFAS 123R period and our results are similar and our conclusions are not affected.

[12] As mentioned earlier, we exclude early or voluntary adopters from this analysis. The exclusion of these firms has no impact on our conclusions.

[13] Oyer and Schaefer (2005) argue that employees who are not among the five highest paid executives can also be senior executives. Following their approach, we use an alternative definition of non-executive option grants by assuming options granted to executives in ranks of 6-10 accounts for 10% of those granted to CEOs. We run our analyses with this alternate definition and obtain similar results.

Next, we add the proxies for the economic and labor market determinants of employee options such as employee sentiment, firm volatility (sorting), the firm's share of industry volatility (retention) and an indicator variable, TIGHT, designed to capture the tightness of the labor markets. This variable takes the value of 1 if the unemployment rate in the MSA area in which the firm is headquartered has decreased relative to the previous year. The results in panel B of Table 3 show that each of the four proxies is significantly associated with non-executive option grants in the predicted direction. Consistent with the sentiment hypothesis, we find that firms with strong past performance grant more options. The results also suggest that firms with higher stock return volatility grant more options, consistent with the sorting hypothesis. To mitigate the concern that firm volatility (calculated using past returns) might be highly correlated with expected volatility, which is an input in calculating the Black-Scholes option value (dependent variable), we use industry volatility as well as the average volatility of all the sample firms each year as alternate proxies for sorting and finding similar results (not tabulated). Consistent with the retention hypothesis, we find a positive association between option grants and a firm's share of industry volatility. Finally, the coefficient on TIGHT is positive and significant, suggesting that firms grant more options to non-executive employees when labor markets are tight.[14] If attraction and retention motives are particularly important in tight labor markets, then we should find that the association between firm volatility (proxy for attraction) and a firm's share of industry volatility (proxy for retention) and employee option grants will strengthen in tight labor markets. Consistent with this conjecture, we find that the coefficient on each of the interaction terms, FIRMVOL*TIGHT

[14] Kedia and Rajgopal (2009) measured tightness of the labor market by a dummy variable indicating whether unemployment in the geographic region of the company's headquarters is higher than the median over the entire time period (tightness of labor markets). When we follow their approach, we find that the coefficient on TIGHT continues to be significant in the predicted direction.

and VOLSHR*TIGHT, is positive and significant at the 5% level (not tabulated). The above evidence shows that economic and labor market considerations significantly influence employee options grants in the cross-section.

However, once we control for these economic and labor market determinants, the coefficient on FINRPT1 is no longer significant. A plausible interpretation of this result is that the explanatory power of FINRPT1 is due to its correlation with the economic determinants of option grants. The coefficient on FINRPT2 continues to be negative, but not significant. This result suggests that the cross-sectional variation observed in employee option grants is better explained by variation in economic and labor market factors than by cross-sectional variation in financial reporting concerns. This result is important, as it underscores the importance of controlling for the economic/labor market determinants of option grants. It also raises the possibility that prior research may have overestimated the role of financial reporting concerns in influencing option grants because they did not control for the relevant economic determinants of options.

An examination of the post SFAS 123R period (2005-2007), when all firms are required to expense the fair value of employee options, shows that sentiment and firm volatility continue to be positively associated with option grants.[15] However, we do not find a significant association between our proxies for retention (VOLSHR) and tightness of labor markets (TIGHT) and option grants in the much shorter post SFAS 123, as the sum of the coefficients on VOLSHR and VOLSHR*POST and TIGHT and TIGHT*POST is not significant. The results also show that new economy firms continue to grant more options,

[15] Prior research typically deflates option grants to non-executive employees by the number of employees. However, we also discuss the results of an additional specification where we deflate option grants by sales as a proxy for the potential income statement impact of expensing options. Our results are similar, and our inference is not sensitive to deflating option grants by either the number of employees or by sales.

even after 123R and firms with more growth options also grant more options. However, the association between dividend yield (and earnings volatility) and option grants is not significant in the post 123R period. Overall, we find that economic determinants continue to be associated with option grants in the post 123R period.

Although, our primary interest lies in examining the role of accounting in influencing non-executive (and total) option grants, we also estimate a model similar to Carter et al. (2007) for option grants to CEOs in order to provide a comparison with their results. These results are not tabulated, but are available from the authors. In the CEO regression, we also control for CEOs' tenure (TENURE) and residual equity incentives (DEV_INC). CEOs close to retirement typically prefer less uncertainty and thus demand more fixed compensation. Core and Guay (1999) find that firms actively use new equity grants to adjust the level of CEOs' incentives provided by their equity holdings. To control for CEO option grants resulting from this adjustment, we use the residuals estimated from the regression of CEOs' equity incentives on the economic determinants of CEOs' equity holdings (DEV_INC). The coefficient on DEV_INC is predicted to be negative.

An examination of the specification similar to Carter et al. (2007) over their sample period 1995-2001 shows that the coefficients on FINRPT1 are positive and significant, but the coefficient on FINRPT2 is not significant. A result that is generally consistent with Carter et al. (2007). When we add the additional determinants of option grants to the model, we find that employee sentiment and firm volatility are significantly associated with CEO options at the 5% and 10% levels, respectively. However, the coefficient on volatility share is negative and significant, and the coefficient on TIGHT is insignificant. The lack of a consistent association between the economic/labor market determinants and CEO options is not

surprising, as these factors are better suited to explain the option grants to non-executives. However, the coefficient on FINRPT1 continues to remain significant after adding the economic and labor market determinants. Overall, the results show that consistent with Carter et al., there is a positive association between financial reporting concerns and CEO option grants. However, note that CEO options comprise about 5% of total option grants made by a typical firm. Thus, in order to argue that financial reporting concerns motivated firms to overuse options prior to SFAS 123R, one needs to examine non-executive options (which comprise 90% of option grants) or total options. However, as shown reported above, when we examine non-executive options or total options, we do not find a significant association between option grants and financial reporting concerns.

Overall, the results reported in Table 3 show that cross-sectional variation in non-executive option grants is significantly associated with the economic and labor market determinants of options. Once the economic and labor market determinants of option grants are controlled for, there is no reliable evidence to support the conjecture that firms with greater financial reporting concerns granted more options. As discussed earlier, while this evidence does not suggest that financial reporting concerns did not influence option grants, at a minimum, they suggest that prior research may have overestimated the role of financial reporting concerns in influencing option grants.

Analysis of change in option grants

In this section, we complement the results of the cross-sectional analysis by relating year-to-year change in option grants to the contemporaneous changes in economic and labor market conditions, as well as changes in other explanatory variables. This approach allows each firm to act as its own control, thereby minimizing the concern that our findings are

driven by some correlated omitted variables. This advantage however, comes at the cost of low power, as this approach eliminates the cross-sectional variation in the level of option grants related to various firm characteristics.

Table 4 reports the results from the regressions of the change in annual option grants to non-executive employees on the corresponding changes in the determinants of employee options over the period 1995-2007. In addition, we add a dummy variable for each year in the sample with year 2000 as the base year. Thus, the intercept captures the change in employee option grants from 1999 to 2000. The results show that changes in sentiment, firm volatility and volatility share are positively associated with change in employee option grants over the entire period in the predicted direction. This evidence confirms the role of economic determinants in influencing employee option grants. The association between the change in employee option grants and the tightness of the labor market is not significant. One reason for the lack of significance of the coefficient on TIGHT could be that TIGHT is a yearly dummy indicating whether the unemployment rate has decreased from the previous year. However, we also have a year dummy for each of the years in the sample period variable, and thus, the year dummies are likely picking up the effect of the unemployment rate on employee options.[16]

The results also show that change in FINRPT1 is positively associated with change in employee option grants, but the coefficient on CH_FINRPT2 is not significant. However, note that the financial reporting concern hypothesis predicts a positive association between change in financial reporting concerns and change in option grants only in the pre-123R period. There is no such expected post-123R, as there is no financial reporting benefit from granting more

[16] The coefficient on TIGHT is significantly positive when we drop the year dummies from the regression.

options relative to other forms of compensation. Thus, we also estimate this analysis separately for the 1995-2004 period (not tabulated). The results show that each of the four economic/labor market proxies are significantly associated with change in option grants over the period 1995-2004, but neither FINRPT1 nor FINRPT2 is significantly associated with change in option grants over the 1995-2004 period.

The results also show that the intercept is positive (0.19) and significant, and the coefficients on each of the year dummies are negative and significant. This suggests that the largest increase in option grants was from 1999 to 2000. Adding the magnitude of the intercept to each of the coefficients shows that the employee option grants increased each year, leading up to year 2000, and they declined thereafter and have been lower ever since. This is consistent with the univariate statistics reported in Table 1. This suggests that the level of annual option grants to employees started to decline well before the requirement to expense options.[17]

Overall, the results of the change analysis validate the results of the cross-sectional analysis and show that the option grants appear to respond to changes in economic and labor market considerations, but there does not appear to be a reliable association between option grants and proxies for financial reporting concerns. This evidence is comforting in the sense insofar as it suggests that the extent of dead-weight economic costs imposed by excessive use of employee options due to favorable accounting treatment appear to be far less than widely perceived (Hall and Murphy, 2002; Carter et al., 2007).

[17] Moreover, it is unlikely that companies were anticipating the requirement of expensing in 2001. It was not until August 2002, after the enactment of Sarbanes-Oxley, that FASB announced its intension to revisit the accounting treatment of option grants.

Analysis of the change in option grants subsequent to voluntary or mandatory expensing of options

It has been argued that firms have cut back on their option grants subsequent to either voluntary or mandatory expensing of employee options (Lavalle, 2005; Carter et al., 2007; Brown and Lee, 2007). However, as discussed earlier, these studies examine the changes in option grants to CEOs and top executives, and they did not control for the corresponding change in the economic determinants of options. Thus, we examine the change in non-executive option grants subsequent to the adoption of SFAS 123R after controlling for the corresponding changes in economic/labor market factors.

Table 5 reports the summary statistics for those firms that voluntarily expensed options before the issuance of SFAS 123R (voluntary or early adopters). The statistics are reported for a two-year period before expensing and a two-year period after expensing. As a comparison, we also report statistics for other firms that did not expense options voluntarily (non-adopters) over the *same* time period. The results show that prior to expensing options, firms that decided to voluntarily expense options made fewer per-employee option grants to non-executive employees relative to the non-adopters ($4,280 versus $16,830). The statistics also indicate that voluntary or early adopters of SFAS 123R had lower prior returns (sentiment), lower firm volatility, and were located in MSA areas with a higher unemployment rate. Thus, the difference in firm characteristics and options usage between the early adopters of SFAS 123R and non-adopters is consistent with our findings that past performance, firm volatility, and the tightness of the labor market significantly influence option grants. The statistics in Table 5 also show that after firms begin to voluntarily expense options, the dollar value of options granted per employee declined from $4,283 to $2,140, a

result that has been interpreted to suggest that expensing options results in reduced option grants (Carter et al., 2007). However, the statistics show that option grants declined dramatically, even in the control sample of non-adopters that chose not to expense options over the same time period. For example, the mean dollar value of per employee option grants declined from $16,830 to $9,030 for the non-adopters. The summary statistics reported earlier in table 1 show that over this period, sentiment, firm volatility, and industry volatility also declined, while the unemployment rate increased. These statistics suggest that an observed reduction in option grants subsequent to expensing options may be due to changes in economic factors, and not necessarily due to changes in the accounting treatment of options.

We examine this issue more formally in Table 6 by relating the change in option grants following the mandatory expensing of options to the level of firms' financial reporting concerns and controlling for the corresponding changes in economic/labor market considerations. An important implication of the financial reporting concerns hypothesis is that firms with greater financial reporting concerns will grant more options prior to SFAS 123R in order to take advantage of the discretion not to expense the fair value of options. Since SFAS 123R takes this accounting benefit away, firms with greater financial reporting concerns prior to 123R should experience a greater reduction in option grants post-123R. In other words, the expected coefficient on FINRPT1 and FINRPT2 is negative.[18] We measure the change in option grants around mandatory adoption as the change in mean option grants over the three-year post-123R period (2005-2007) minus the mean of option grants over a three-year period prior to adoption of 123R (2002-2004). As an alternative, we also calculate the change in

[18] Since options have to be expensed post-123R, relating change in financial reporting concerns (from before 123R to after) to change in option grants post-123R is not meaningful, as the change in financial reporting concerns should have no impact on option grants when options have to be expensed.

option grants using a 2-year mean as the change in the mean option over 2005-2006 minus the corresponding mean over 2003-2004.

The results of the mean change over a three-year period show that changes in employee sentiment, firm volatility and volatility share are positively associated with the change in employee option grants subsequent to the decision to expense stock options. The coefficient on TIGHT has the opposite sign (negative) with a p-value of 0.10. Although the coefficients on the two proxies for financial reporting concerns have the predicted negative sign, they are not significant. This suggests that changes in option grants following the adoption of 123R are associated with corresponding changes in the economic determinants of options. The evidence does not show that firms with greater financial reporting concerns prior to SFAS 123R reduced option grants more. An examination of change in option grants over a two-year post-123R period shows that change in sentiment and firm volatility are significantly associated with change in option grants at conventional levels.[19] However, the coefficients on the financial reporting proxies are not significant. Overall, the results do not appear to support the financial reporting concerns hypothesis that firms with greater financial reporting concerns prior to SFAS 123R reduced option grants more subsequent to mandatory expensing of options. Rather, the results suggest that the change in option grants is associated with corresponding changes in economic determinants.

V. Conclusions

The determinants of the dramatic increase in the use of employee stock options in the 1990s and the subsequent decline in their popularity have been the subject of intense debate.

[19] The significant association between employee sentiment and option grants is also consistent with anecdotal evidence that the stock market crash and the collapse of the technology sector reduced the attractiveness of employee stock options prompting firms to cut back on options (Jung, 2003).

The extant evidence suggests that discretion granted to firms to avoid recognizing the fair value of options as an expense led to their overuse for employee compensation, and the requirement to expense options under SFAS 123R has caused firms to reduce their option grants. However, prior studies investigating these questions have tended to focus on option grants to top executives and have generally not controlled for some key economic and labor market determinants known to influence broad-based employee option grants. We revisit this issue with the benefit of post-SFAS 123R data and the addition of controls for key economic and labor market factors. Our analysis focuses on non-executive options, as such grants comprise almost 90% of employee option grants.

In contrast to prior research, we do not find an association between financial reporting concerns and employee option grants after controlling for the relevant economic/labor market factors. An analysis of change in option use over 1995-2007 confirms the association between option grants and economic determinants. Finally, an examination of change in option use subsequent to the mandatory adoption of SFAS 123R shows that firms with a higher level of reporting concerns prior to adoption experienced a comparable reduction in options versus those firms with a lower level of reporting concerns. This evidence is not consistent with financial reporting concerns affecting the magnitude of option grants prior to 123R. Overall, our results suggest that the role of accounting in influencing employee option grants has likely been overstated and the dead-weight economic costs from overuse of options appear to be less than widely perceived.

References

Aboody, D. 1996. Market valuation of employee stock options. *Journal of Accounting and Economics* 22: 357-391.

———, M. Barth, and R. Kasznik. 2004a. Firms' voluntary recognition of stock-based compensation expense**.** *Journal of Accounting Research* 42(2): 123-150.

———, ———, and ———. 2004b. SFAS No. 123 stock-based compensation expense and equity market values. *The Accounting Review* 79 (2): 251-275.

Accounting Principles Board (APB). 1972. *APB Opinion No. 25: Accounting for Stock Issued to Employees*. Norwalk, CT: APB.

Arya, A. and B. Mittendorf. 2005. Offering stock options to gauge managerial talent. *Journal of Accounting and Economics* 40: 189-210.

Baber, W., S. Janakiraman, and S. Kang. 1996. Investment opportunities and the structure of executive compensation. *Journal of Accounting and Economics* 21: 297-318.

Baber, M., J. Elliott, and M. Finn. 1999. Market rewards associated with patterns of increasing earnings. *Journal of Accounting and Research* 37: 387-413.

Bartov, E., D. Givoly, and C. Hayn. 2002. The rewards to meeting or beating earnings expectations. *Journal of Accounting and Economics* 33 (2): 173-204.

——— and P. Mohanram. 2004. Private information, earnings manipulations, and executive stock-option exercises. *The Accounting Review* 79 (4): 889-920.

Beatty, A., B. Ke, and K. Patroni. 2002. Earnings Management to Avoid Earnings Declines Across Publicly and Privately Held Banks. *The Accounting Review* 77 (3): 547-570.

Benartzi, S. 2001. Excessive extrapolation and the allocation of company stock to retirement accounts. *Journal of Finance* 56(5): 1747-1764.

Bergman, N. K. and D. Jenter, 2007. Employee sentiment and stock option compensation. *Journal of Financial Economics* 84: 667-712.

Bergstresser, D. and T. Philippon. 2006. CEO incentives and earnings management. *Journal of Financial Economics* 80 (3): 511-529.

Bodie, Z., R. Kaplan, and R. Merton. 2003. For the last time: stock options are an expense. *Harvard Business Review* 81 (3): 63-71.

Brown, L. and Y., Lee. 2007. The Impact of SFAS 123R on Changes in Option-Based Compensation. *Working paper*, Georgia State University.

Bryan, S., L. Hwang, and S. Lilien. 2000. CEO stock-based compensation: An empirical analysis of incentive-intensity, relative mix, and economic determinants. *Journal of Business* 73 (October): 661–693.

Burns N. and Kedia S. 2006. The impact of performance-based compensation on misreporting. *Journal of Financial Economics* 79: 35–67.

Burgstahler, D. and M. Eames. 1999. Management of earnings and analyst forecasts. *Working paper*, University of Washington.

Callaghan, S. R., M. Stanford, and C. Subramaniam. 2008. Do broad-based option compensation plans improve future firm performance for technology and non-technology firms? *Working paper*, Texas Christian University.

Carter, M. and L. Lynch. 2003. The consequences of the FASB's 1998 proposal on accounting for stock option repricing. *Journal of Accounting and Economics* 35: 51-72.

———, ———, and I. Tuna. 2007. The role of accounting in the design of CEO equity compensation. *The Accounting Review*, 82(2): 321-357.

Chaudhary, P., S. Rajgopal and M. Venkatachalam. 2009. Accelerated vesting of employee stock options in anticipation of FAS 123-R. *Journal of Accounting Research* 47 (1): 105-146.

Core, J. and W. Guay. 1999. The use of equity grants to manage optimal equity incentive levels. *Journal of Accounting and Economics* 28: 151-184.

———, and ———. 2001. Stock option plans for non-executive employees. *Journal of Financial Economics* 61 (August): 253–287.

———, ———, and D. Larcker. 2003. Executive equity compensation and incentives: A survey. *Economic Policy Review* (April): 27-50.

———, Holthausen, R., and D. Larcker. 1999. Corporate governance, chief executive officer compensation, and firm performance. *Journal of Financial Economics* 51: 371–406.

Dechow, P., A. Hutton, and R. Sloan. 1996. Economic consequences of accounting for stock-based compensation. *Journal of Accounting Research* 34 (1996): 1-20.

Demsetz, H. and K. Lehn 1985. The structure of corporate ownership: causes and consequences. *Journal of Political Economy*: 1155-1177.

Degeorge, F., J. Patel, and R. Zeckhauser. 1999. Earnings management to exceed thresholds. *Journal of Business* 72 (1): 1-33.

Dichev, I. D. and D. J. Skinner. 2002. Large-sample evidence on the debt covenant hypothesis. *Journal of Accounting Research* 40 (4): 1091-1123.

Dyreng, S. 2009. The cost of private debt covenant violation. Working paper, Duke University.

Ferri, F. and T. Sandino. 2009. The impact of shareholder activism on financial reporting and compensation: The case of employee stock options expensing. *The Accounting Review*, 84 (2): 433-466.

Financial Accounting Standards Board. 1995 *Statement of Financial Accounting Standards No.123: Accounting for Stock-Based Compensation*. Norwalk, CT: FASB.

Financial Accounting Standards Board. 2004. *Statement of Financial Accounting Standards No.123R: Share-Based Payment.* Norwalk, CT: FASB.

Hall, B. and K. Murhpy. 2002. Stock options for undiversified executives. *Journal of Accounting and Economics* 33 (1): 3-42.

——— and ———. 2003. The trouble with stock options. *Journal of Economic Perspectives* 17: 49–70.

Hays, R. , M. Lemmon, and M. Qiu. 2011. Stock options and managerial incentives for risk-taking: evidence from FAS 123R, forthcoming *Journal of Financial Economics*.

Himmelberg, C., G. Hubbard, and D. Palia. 1999. Understanding the determinants of managerial ownership and the link between ownership and performance. *Journal of Financial Economics* 53: 353–384.

Hodge F., S. Rajgopal, and T. Shevlin. 2008. Do managers value stock options and restricted stock consistent with economic theory? *Contemporary Accounting Research*, forthcoming.

Ittner, K., R. Lambert, and D. Larcker. 2003. The structure and performance consequences of equity grants to employees of new economy firms. *Journal of Financial Economics* 34: 89–127.

Jensen, M. *and K.* Murphy. 1990. Performance Pay and Top Management Incentives. *Journal of Political Economy* 98(2):225-264.

———, ———, and E. Wruck. 2004. Remuneration: where we've been, how we got to here, what are the problems, and how to fix them. *Working Paper*, European Corporate Governance Institute.

Jung, H. (2003). "Microsoft give shares to its workers." *The Associated Press.*

Kole, S. R. The complexity of compensation contracts. *Journal of Financial Economics* 43: 79-104

Kedia, S. and S. Rajgopal, 2009. Neighborhood matters: the impact of location on broad based stock option plans. *Journal of Financial Economics* 92: 109-127

Lang, L., R. Stulz, and R. Walking. 1991. A test of the free cash flow hypothesis: the case of bidder returns. *Journal of Financial Economics* 29: 315-355.

Lavelle, L. More than one way to feed a fat cat. *Business Week*. 2003/11/3.

Lavelle, L. Kicking the stock-options habit. *Business Week*. 2005/2/16.

Matsunaga, S. 1995. The effects of financial reporting costs on the use of employee stock options. *The Accounting Review* 70, 1-26.

McConnell, J. and H. Servaes. 1990. Additional evidence on equity ownership and corporate value. *Journal of Financial Economics* 27: 593–612.

Mehran, H. and J. Tracy. 2001. The effect of employee stock options on the evolution of compensation in the 1990s. *Economic Policy Review* Vol7, No. 3, Federal Reserve Bank of New York.

Merton, R. 1973. Theory of rational option pricing. Bell Journal of Economics and Management Science 4, 141-183.

Morck, R., A. Shleifer, and R. Vishny. 1988. Management ownership and market valuation: an empirical analysis. *Journal of Financial Economics* 20, 293–316.

Murphy, K. 1985. Corporate performance and managerial remuneration. *Journal of Accounting and Economics* 7 (1-3): 11-42.

———. "Executive Compensation." In O. Ashenfelter and D. Card, eds., Handbook of Labor Economics, Vol. 3. Amsterdam: North-Holland.

Oyer, P. 2004. Why do firms use incentives that have no incentive effects? *Journal of Finance* 59: 1619–1640.

——— and S. Schaefer, 2005. Why do some firms give stock options to all employees?: An empirical examination of alternative theories. *Journal of Financial Economics* 76, 99–133.

Rajgopal, S. and T. Shevlin. 2002. Empirical evidence on the relation between stock option compensation and risk taking. *Journal of Accounting and Economics* 2 (33): 145–171.

———, ———, and V. Zamora 2006. "CEOs' outside employment opportunities and the lack of relative performance evaluation in the compensation contracts". *Journal of Finance* 61 (4): 1813–1844.

Richardson, S., A., S.,H. Teoh, and P. D. Wysocki. 2004. The walk-down to beatable analysts' forecasts: The role of equity issuance and insider trading incentives. *Contemporary Accounting Research 21* (4): 885-924.

Smith, C., and R. Watts. 1992. The investment opportunity set and corporate financing, dividend, and compensation policies. *Journal of Financial Economics* 7: 117-61.

Teoh, S. H. and T., J. Wong. 1998. Earnings management and the long-run market performance of initial public offerings. *Journal of Finance* 53 (6): 1935-1974.

Yermack, D. 1995. Do corporations award CEO stock options effectively? *Journal of Financial Economics* 39 (2-3): 237-269.

Appendix A: Variable Definition

$EMPOPT_{jt}$ = the natural logarithm of the per-employee Black-Scholes value of stock options granted to non-executive employees at firm *j* in year *t*. The approach to obtain the Black-Scholes value of option grants to non-executives is based on Bergerman and Jenter (2007) with some modification;

$EMPOPT\_PRE_{jt}$ = the natural logarithm of the per-employee Black-Scholes value of stock options granted to non-executive employees at firm *j* in year *t-1*;

Proxies for employee sentiment, attraction and retention, and financial reporting concerns

$SENTIMENT_{jt}$ = the annualized stock return of firm *j* calculated from the beginning of year *t*-2 to the end of year *t*-1;

$FIRMVOL_{jt}$ = the standard deviation of firm *j*'s monthly stock returns in year *t*;

$VOLSHR_{jt}$ = the average R-square obtained from regressions of every CRSP firm's monthly returns on the industry monthly average returns within the same 3 SIC codes;

$UNEMP_{jt}$ = annual unemployment rate calculated for the metropolitan statistical area (MSA) where a firm's headquarters are located;

$TIGHT_{jt}$ = one if *UNEMP* decreases from year *t-1* to year *t*, and zero otherwise;

$FINRPT1_{jt}$ = (0.81**FREQMBE* +0.80**FREQEPSUP* –0.51**LEVERAGE*) for firm *j* in year *t*

$FREQMBE_{jt}$ = the proportion of quarters that a firm met or beat analysts' EPS forecasts over the past 8 quarters;

$FREQEPSUP_{jt}$= the proportion of quarters that a firm's EPS was equal to or greater than the EPS of the same quarter of the prior year, measured over the past 8 quarters;

LEV_{jt} = the ratio of total debts to total assets measured at the end of the year;

$FINRPT2_{jt}$ = (0.79**ISSUE_EQ* +0.81**ISSUE_DEBT*) for firm *j* in year *t*; where;

$ISSUE\_EQ_{jt}$ = [(the increase from year *t* to year *t*+1 in Compustat #85 +Compustat #210 +Compustat #130 – Compustat #88) /Compustat #6]. If this calculation yields a negative number, we replace the value with 0;

$ISSUE\_DB_{jt}$ = [(the increase from year *t* to year *t*+1 in Compustat #34 +Compustat #9) /Compustat #6]. If this calculation yields a negative number, we replace the value with 0;

Control variables

$ASSET_{jt}$ = the natural logarithm of total assets at the end of year *t* for firm *j*;

BM_{jt} = the ratio of the book value of total assets to the sum of the market value of equity and the book value of liability at the end of year *t* for firm *j* based on Core and Guay (1999);

$CASHCSTR_{jt}$ = the three-year average over year *t*-3 to *t*-1 of [(common and preferred dividends – cash flow from investing – cash flow from operations)/ total assets] for firm *j*;

$DIVYLD_{jt}$ = three-year average over year *t*-3 to *t*-1 of [dividends per share/price per share] for firm *j*;

DEV_INC_{jt} = the natural logarithm of (actual incentive level/predicted incentive level) for year *t*-1. Actual incentive level is the delta of the equity portfolio, and predicted incentive level is estimated from a model based on Core and Guay (1999) for the CEO of firm *j*;

$EARNVOL_{jt}$ = the square of the standard deviation of ROA, where the standard deviation of ROA is calculated over ten years (a minimum of 5 observations is required) prior to year *t* for firm *j*;

$EQCSTR_{jt}$ = # of shares granted to all employees in year *t-1* / total shares outstanding for firm j at the end of year *t-1*;

$NEWECON_{jt}$ = new economy firms with the following four-digit SIC codes: 4812-4899, 3820-3869, 2830-2839, 3660-3679, and 7370-7379;

RET_{jt} = the cumulative 12-month returns for year *t* for firm *j*;

$TENURE_{jt}$ = the number of years the CEO has been in that position (if missing, the number of years at the firm) for firm *j* as of the end of year *t*;

Table 1: Summary Statistics
Panel A: Mean of annual stock option grants

Year	Non-Executive Employees ($000)	Per-Employee ($000)	CEO ($000)	Top-5 ($000)	Total ($000)	Employee as % of Total	Num. of firms
	(1)	(2)	(3)	(4)	(5)	(1) / (5)	
1995	14,309	3.76	853	2,158	16,467	87%	1,068
1996	18,025	3.94	1,462	3,170	21,194	85%	1,081
1997	27,351	5.91	1,724	4,018	31,369	87%	1,072
1998	39,462	8.77	2,531	5,654	45,116	87%	974
1999	63,986	13.13	3,102	7,335	71,321	90%	939
2000	115,012	23.89	4,403	10,139	125,151	92%	879
2001	95,184	18.21	4,407	9,616	104,800	91%	866
2002	54,051	10.08	2,874	6,550	60,602	89%	954
2003	41,243	8.84	1,895	4,599	45,841	90%	950
2004	46,472	10.1	2,290	5,198	51,671	90%	1,057
2005	36,129	7.72	2,078	4,719	40,849	88%	1,135
2006	28,401	5.45	1,488	3,384	31,785	89%	1,068
2007	24,809	4.61	1,295	3,063	27,872	89%	978

Table 1, Panel A reports the mean values of annual stock option grants to non-executive employees, CEOs, top-five executives, and all employees from year 1995 through 2007. Non-executive employees are defined as all employees, excluding the top-five executives. The values of stock option grants are calculated using the modified Black-Scholes model. Per employee stock option grants are the value of non-executive employee stock option grants divided by the number of employees in the year.

Panel B: Mean of economic determinants and financial reporting costs by year

Year	SENTIMENT	FIRMVOL	VOLSHR	UNEMP	FINRPT1	FINRPT2
1995	9.93%	8.72%	0.19	5.60%	1.36	0.06
1996	13.27%	9.83%	0.24	5.34%	1.40	0.06
1997	24.49%	10.43%	0.25	4.85%	1.39	0.08
1998	24.23%	13.60%	0.32	4.41%	1.41	0.09
1999	17.29%	14.68%	0.24	4.00%	1.40	0.08
2000	14.49%	17.59%	0.28	3.94%	1.41	0.06
2001	21.26%	15.33%	0.33	4.75%	1.48	0.07
2002	9.37%	14.38%	0.33	6.00%	1.40	0.08
2003	-6.34%	11.87%	0.28	6.18%	1.40	0.07
2004	9.49%	9.36%	0.29	5.57%	1.52	0.06
2005	32.05%	9.15%	0.29	5.15%	1.55	0.07
2006	15.60%	8.59%	0.27	4.63%	1.55	0.07
2007	12.69%	8.02%	0.25	4.68%	1.50	0.06

Panel C: Mean of other firm characteristics by year

Year	BM	CASHCSTR	DIVYLD	ASSET	EQCSTR	EARNVOL	RET	NEWECON
1995	0.65	0.02	1.73	6.99	0.02	0.35%	29.23%	20.13%
1996	0.65	0.03	1.61	7.05	0.02	0.42%	18.04%	21.74%
1997	0.60	0.03	1.49	7.12	0.02	0.41%	29.49%	23.60%
1998	0.63	0.02	1.13	7.14	0.03	0.47%	7.20%	26.08%
1999	0.63	0.03	1.01	7.17	0.03	0.60%	29.40%	26.84%
2000	0.65	0.02	1.03	7.31	0.03	0.64%	21.41%	27.87%
2001	0.63	0.02	1.04	7.37	0.03	0.67%	8.90%	28.98%
2002	0.72	0.01	0.92	7.35	0.04	0.98%	-15.26%	30.29%
2003	0.61	0.00	0.85	7.33	0.03	1.19%	49.89%	32.21%
2004	0.59	-0.01	0.79	7.35	0.03	1.18%	19.17%	33.30%
2005	0.59	-0.01	0.82	7.41	0.02	1.15%	14.27%	33.48%
2006	0.59	-0.01	0.82	7.55	0.02	0.93%	14.20%	32.21%
2007	0.65	-0.01	0.96	7.78	0.01	0.70%	4.74%	28.53%

Panel B and Panel C report the means of economic determinants, financial reporting concerns, and related firm characteristics over our sample period 1995-2007. All variables are defined in Appendix A.

Table 2: Correlation Matrix (Spearman lower left; Pearson upper right)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) EMPOPT	1	0.18	0.37	0.04	-0.06	0.16	0.15	0.17	-0.36	0.29	-0.15	-0.38	0.09	0.36	0.46
		(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
(2) SENTIMENT	0.10	1	-0.01	0.07	-0.08	0.37	-0.04	-0.04	-0.10	-0.03	0.01	-0.30	-0.08	-0.03	0.04
	(0.00)		*(0.09)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.24)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
(3) FIRMVOL	0.34	-0.06	1	0.14	-0.11	-0.06	0.19	0.25	-0.32	0.27	-0.34	-0.02	0.06	0.29	0.23
	(0.00)	*(0.00)*		*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.01)*	*(0.00)*	*(0.00)*	*(0.00)*
(4) VOLSHR	0.02	0.05	0.14	1	0.03	-0.03	-0.01	0.00	0.11	-0.01	0.14	0.12	-0.07	0.02	-0.09
	(0.01)	*(0.00)*	*(0.00)*		*(0.00)*	*(0.00)*	*(0.26)*	*(0.70)*	*(0.00)*	*(0.09)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.03)*	*(0.00)*
(5) UNEMP	-0.03	-0.08	-0.12	0.04	1	-0.03	-0.02	-0.04	0.08	-0.01	0.15	0.07	0.01	-0.05	-0.03
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*		*(0.00)*	*(0.08)*	*(0.00)*	*(0.00)*	*(0.41)*	*(0.00)*	*(0.00)*	*(0.49)*	*(0.00)*	*(0.00)*
(6) FINRPT1	0.17	0.41	-0.06	-0.03	-0.02	1	-0.04	-0.19	-0.23	0.02	-0.01	-0.30	0.01	0.02	0.12
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.01)*		*(0.00)*	*(0.00)*	*(0.00)*	*(0.01)*	*(0.10)*	*(0.00)*	*(0.14)*	*(0.07)*	*(0.00)*
(7) FINRPT2	0.03	-0.07	0.06	0.01	0.02	-0.08	1	0.16	-0.10	0.20	-0.18	-0.10	0.04	0.10	0.13
	(0.00)	*(0.00)*	*(0.00)*	*(0.09)*	*(0.04)*	*(0.00)*		*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
(8) CASHCSTR	0.08	-0.10	0.22	0.02	-0.04	-0.22	0.04	1	-0.05	0.20	-0.12	0.11	-0.02	0.10	0.08
	(0.00)	*(0.00)*	*(0.00)*	*(0.02)*	*(0.00)*	*(0.00)*	*(0.00)*		*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.08)*	*(0.00)*	*(0.00)*
(9) DIVYLD	-0.40	-0.04	-0.47	0.05	0.05	-0.19	-0.02	-0.08	1	-0.17	0.32	0.26	-0.03	-0.21	-0.29
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.07)*	*(0.00)*		*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
(10) EARNVOL	0.36	-0.10	0.45	0.02	0.00	0.01	0.07	0.01	-0.45	1	-0.23	-0.12	0.02	0.18	0.23
	(0.00)	*(0.00)*	*(0.00)*	*(0.08)*	*(0.86)*	*(0.38)*	*(0.00)*	*(0.10)*	*(0.00)*		*(0.00)*	*(0.00)*	*(0.04)*	*(0.00)*	*(0.00)*
(11) ASSET	-0.12	0.05	-0.41	0.14	0.08	-0.02	-0.07	-0.08	0.41	-0.40	1	0.18	-0.04	-0.20	-0.21
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.01)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*		*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
(12) BM	-0.37	-0.29	-0.05	0.13	0.05	-0.30	-0.03	0.19	0.24	-0.24	0.20	1	-0.38	-0.06	-0.30
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*		*(0.00)*	*(0.00)*	*(0.00)*
(13) RET	0.00	-0.04	-0.12	-0.09	0.05	0.02	-0.02	-0.06	0.04	-0.05	0.04	-0.35	1	0.03	0.05
	(0.94)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.01)*	*(0.02)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*		*(0.00)*	*(0.00)*
(14) EQCSTR	0.52	-0.06	0.43	-0.02	-0.03	0.08	0.05	0.10	-0.42	0.37	-0.29	-0.14	-0.05	1	0.19
	(0.00)	*(0.00)*	*(0.00)*	*(0.02)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*		*(0.00)*
(15) NEWECON	0.44	0.00	0.23	-0.07	-0.02	0.12	0.04	0.03	-0.34	0.38	-0.21	-0.32	-0.02	0.32	1
	(0.00)	*(0.94)*	*(0.00)*	*(0.00)*	*(0.01)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.09)*	*(0.00)*	

This table reports the correlation matrix. P-values are listed in parentheses. All variables are defined is Appendix A.

TABLE 3: Determinants of annual stock options

		Panel A		Panel B	
		Coeff	P value	Coeff	P value
INTRECEPT	?	0.276	(0.00)***	-0.003	(0.96)
POST	?	-0.215	(0.04)**	-0.104	(0.41)
SENTIMENT	+			0.177	(0.00)***
FIRMVOL	+			0.947	(0.00)***
VOLSHR	+			0.291	(0.00)***
TIGHT	-			0.106	(0.00)***
FINRPT1	?	0.080	(0.00)***	0.032	(0.17)
FINRPT2	?	-0.044	(0.43)	-0.055	(0.31)
CASHCSTR	+	0.478	(0.00)***	0.328	(0.00)***
DIVYLD	-	-0.034	(0.00)***	-0.030	(0.00)***
EARNVOL	+	1.307	(0.02)**	1.294	(0.03)**
EQCSTR	-	-2.705	(0.00)***	-2.662	(0.00)***
ASSET	+	0.010	(0.02)**	0.018	(0.00)***
BM	-	-0.293	(0.00)***	-0.259	(0.00)***
RET	+	0.162	(0.00)***	0.173	(0.00)***
EMPOPT_PRE	+	0.803	(0.00)***	0.786	(0.00)***
NEWECON	?	0.175	(0.00)***	0.168	(0.00)***
SENTIMENT*POST	?			-0.085	(0.11)
FIRMVOL*POST	?			0.628	(0.14)
VOLSHR*POST	?			-0.391	(0.00)***
TIGHT*POST	?			-0.162	(0.00)***
FINRPT1*POST	?	0.002	(0.97)	0.037	(0.42)
FINRPT2*POST	?	0.040	(0.68)	0.040	(0.68)
CASHCSTR*POST	?	-0.313	(0.10)*	-0.275	(0.14)
DIVYLD*POST	?	0.027	(0.00)***	0.032	(0.00)***
EARNVOL*POST	?	-1.033	(0.19)	-1.444	(0.07)*
EQCSTR*POST	?	-4.290	(0.00)***	-4.088	(0.00)***
ASSET*POST	?	-0.014	(0.12)	-0.006	(0.52)
BM*POST	?	0.193	(0.00)***	0.149	(0.03)**
RET*POST	?	-0.006	(0.88)	-0.024	(0.54)
EMPOPT_PRE*POST	?	0.023	(0.30)	0.031	(0.17)
NEWECON*POST	?	-0.063	(0.08)*	-0.047	(0.19)
R square		75.5%		76.5%	
Obs		13,021		13,021	

Table 3 reports the regression results on the determinants of annual option grants to non-executive employees for the fiscal years 1995-2007. A variable definition is provided in Appendix A. Firms that voluntarily expensed option grants before 2005 are excluded from the sample. Economic and labor market determinants (SENTIMENT FIRMVOL VOLSHR TIGHT) are excluded (or included) in Panel A (or Panel B).. All p-values (in parentheses) are based on standard errors adjusted for clustering at firm and year levels. ***, **, * represent statistical significance at the 0.01, 0.05 and 0.1 levels, respectively.

TABLE 4: Annual changes in stock options granted to non-executive employees

		1995-2007	
		Coeff	P value
INTERCEPT	?	0.190	(0.00)***
CH_SENTIMENT	+	0.182	(0.00)***
CH_FIRMVOL	+	0.241	(0.05)**
CH_VOLSHR	+	0.267	(0.00)***
TIGHT	+	-0.019	(0.27)
CH_FINRPT1	?	0.054	(0.02)**
CH_FINRPT2	?	-0.048	(0.31)
CH_CASHCSTR	+	0.169	(0.25)
CH_DIVYLD	-	-0.089	(0.00)***
CH_EARNVOL	+	1.991	(0.15)
CH_ASSET	+	0.184	(0.00)***
CH_BM	-	-0.323	(0.00)***
CH_RET	+	0.036	(0.01)***
CH_EQCSTR	-	-8.055	(0.00)***
NEWECON	?	-0.049	(0.00)***
YR1995	?	-0.119	(0.00)***
YR1996	?	-0.141	(0.00)***
YR1997	?	-0.127	(0.00)***
YR1998	?	-0.018	(0.56)
YR1999	?	-0.061	(0.04)**
YR2001	?	-0.271	(0.00)***
YR2002	?	-0.381	(0.00)***
YR2003	?	-0.379	(0.00)***
YR2004	?	-0.141	(0.00)***
YR2005	?	-0.408	(0.00)***
YR2006	?	-0.428	(0.00)***
YR2007	?	-0.286	(0.00)***
R square		15.60%	
Obs		11,261	

Table 4 reports the regression results on the determinants of annual changes in stock option grants to non-executive employees for the fiscal years 1995-2007. All change variables are measured as changes from fiscal year *t-1* to year *t* and the variable definition is provided in Appendix A. Firms that voluntarily expensed option grants before 2005 are excluded. All p-values (in parentheses) are based on standard errors adjusted for clustering at firm and year levels. ***, **, * represent statistical significance at the 0.01, 0.05 and 0.1 levels, respectively.

Table 5: Option usage, economic determinants, and financial reporting costs before and after the adoption of SFAS 123R for early adopters, non-adopters and mandatory adopters

		Before Adoption	After Adoption
Early adopters[a]	Per employee option grants	$4,283	2,142
	SENTIMENT	0.08	0.12
	FIRMVol	0.10	0.07
	VOLSHR	0.32	0.32
	UNEMP	6.08%	5.94%
	FINRPT1	1.36	1.44
	FINRPT2	0.03	0.04
	BM	0.77	0.74
	Total Assets (M)	$46,428	55,490
Non-adopters[b]	Per employee option grants	$16,830	9,033
	SENTIMENT	0.12	0.08
	FIRMVOL	0.15	0.11
	VOLSHR	0.31	0.30
	UNEMP	5.36%	5.77%
	FINRPT1	1.45	1.47
	FINRPT2	0.07	0.07
	BM	0.64	0.62
	Total Assets (M)	$6,311	7,128
Mandatory adopters[c]	Per employee option grants	$9,488	5,714
	SENTIMENT	0.04	0.22
	FIRMVOL	0.10	0.08
	VOLSHR	0.28	0.28
	UNEMP	5.89%	4.95%
	FINRPT1	1.47	1.55
	FINRPT2	0.06	0.07
	BM	0.44	0.61
	Total Assets (M)	$6,785	7,984

Table 5 reports the mean values of stock option grants to non-executive employees on a per employee basis and firm characteristics around the year of adopting SFAS 123R. Per employee stock option grants are the value of non-executive employee stock option grants divided by the number of employees in the year. Non-executive employees are defined as all employees except for the top-five executives. The values of stock option grants are calculated using the modified Black-Scholes model. All other variables are defined in Appendix A. [a] "Early adopters" are firms that voluntarily adopted option expensing during 2002-2004; the "Before Adoption" column is calculated for each variable as the average of years *t-1* and *t-2*; the "After Adoption" column is calculated for each variable as the average of years *t* and *t+1*, where year *t* is when the firm began voluntarily expensing stock option grants. [b] "Non-adopters" include all firm-years in 2002-2004 for firms that did not adopt expensing of options before 2005. The "Before Adoption" column is calculated for each variable as the average of years *t-1* and *t-2*; the "After Adoption" column is calculated for each variable as the average of years *t* and *t+1*, where *t* equals 2002-2004. c. "Mandatory-adopters" include all firms that mandatorily adopted expensing as required by SFAS 123R, i.e., firms that did not adopt expensing of options before 2005. The "Before Adoption" column is calculated for each variable as the average of years 2003 and 2004; the "After Adoption" column is calculated for each variable as the average of years 2005 and 2006.

Table 6: Changes in stock options granted to non-executives around the mandatory adoption of SFAS 123R.

		3 year window	2 year window
INTERCEPT	?	0.077	0.054
		(0.62)	*(0.76)*
CHG123R_SENTIMENT	+	0.135	0.119
		*(0.04)***	*(0.05)***
CHG123R_FIRMVOL	+	0.873	1.264
		*(0.09)**	*(0.01)****
CHG123R_VOLSHR	+	0.539	0.197
		*(0.07)**	*(0.46)*
TIGHT	+	-0.177	-0.053
		*(0.10)**	*(0.49)*
PRE123R_FINRPT1	?	-0.100	-0.071
		(0.20)	*(0.26)*
PRE123R_FINRPT2	?	-0.232	0.046
		(0.24)	*(0.77)*
CHG123R_CASHCSTR	+	0.629	0.288
		*(0.02)***	*(0.24)*
CHG123R_DIVYLD	-	-0.064	-0.064
		*(0.00)****	*(0.01)****
CHG123R_EARNVOL	+	0.218	-0.107
		*(0.05)***	*(0.55)*
CHG123R_ASSET	+	0.031	0.084
		(0.59)	*(0.20)*
CHG123R_BM	-	-0.291	-0.695
		*(0.00)****	*(0.00)****
CHG123R_RET	+	-0.066	-0.024
		(0.20)	*(0.60)*
CHG123R_EQCSTR	-	6.404	5.650
		*(0.00)****	*(0.00)****
NEWECON	?	-0.237	-0.165
		*(0.00)****	*(0.00)****
R square		27.9%	14.7%
Obs		964	892

Table 6 reports the regression results on the changes in option grants to non-executive employees around mandatory adoption of SFAS 123R. The changes around mandatory adoption are calculated as the average values over 2005-2007 minus the average over 2002-2004 (3-year window), or the average values of 2005-2006 minus the average of 2003-2004 (2-year window). P-values are in parentheses. ***, **, * represent statistical significance at the 0.01, 0.05 and 0.1 levels, respectively.