Managerial Short-Termism and Investment:

Evidence from Accelerated Option Vesting*

Tomislav Ladika

University of Amsterdam

t.ladika@uva.nl

Zacharias Sautner

Frankfurt School of Finance & Management

z.sautner@fs.de

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Abstract

We show that executives with more short-term incentives engage in myopic behavior by reducing investment. We document this effect by exploiting a unique event, in which more than 700 firms accelerated the vesting periods on executive stock options to avoid an accounting expense under FAS 123-R. This led to a substantial decrease in executives' incentives—at accelerating firms 52% of unvested equity became immediately exercisable, and CEOs responded with a significant increase in both option exercises and equity sales. To identify causality, we exploit exogenous variation in the timing of FAS 123-R—firms with fiscal year ending June or later had to comply in 2005, while all other firms could postpone compliance until 2006. We show that firms that accelerated option vesting in response to an earlier FAS 123-R compliance date reduce investment. This effect is concentrated among firms that face low competition and low analyst coverage.

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1. Introduction

How prevalent is managerial short-termism? Do managers with short-term incentives decrease investment to boost current earnings or cash flows, possibly at the expense of long-run firm value? In surveys, the vast majority of top executives indicate they are willing to cut or delay investment to meet short-term targets (e.g., Graham, Harvey, and Rajgopal [2005]). Theoretical work shows that even in the presence of efficient markets, managers with short horizons may engage in value-destroying actions to boost the short-term stock price.[1] Corporate investment is particularly susceptible to managerial myopia because its benefits usually arise only in the long term, but managers often have broad leeway to quickly reduce or postpone investment to boost current earnings or cash flows. Establishing whether managerial short-termism is widespread is important so that corporate boards, shareholders, and policymakers can determine whether compensation contracts and governance mechanisms convey sufficient long-term incentives to managers. Despite this importance, our knowledge of the extent of managerial myopia is limited by a lack of cleanly identified empirical evidence.

This paper's contribution is to show that a sharp decrease in managerial horizon, caused by accelerated vesting of stock options, led to a substantial reduction in real investment and other sources of discretionary spending. Vesting periods are a crucial determinant of incentive horizon because executives do not receive ownership of stock options until they vest, which typically occurs over a three- to five-year period (Gopalan et al. [2013], Cadman, Rusticus, and Sunder [2013]). Once options vest, executives are generally free to exercise them and sell the underlying shares. All holdings of firm equity convey effort incentives to managers, but vesting periods are a crucial determinant of incentive horizon as they are usually the only explicit mechanism preventing executives from unwinding their equity incentives. Therefore, a direct economic link exists between equity vesting periods and managerial incentive horizon—when vesting periods are short, executives are more likely to undertake myopic actions that boost short-term performance, because they can sell the bulk of their holdings before the long-term costs of their decisions are realized.

In order to establish the link between incentive horizons and investment, we examine a unique statutory accounting change that led to a plausibly exogenous decrease in the vesting periods of executives' stock options. Exploiting an *exogenous* shock to vesting periods is crucial, because simply

[1] Theoretical work predicts that managerial myopia can lead executives to sell productive assets or delay vital investments (see Narayanan [1985], Stein [1988, 1989], Thakor [1990], Bizjak, Brickley, and Coles [1993], Bebchuk and Stole [1993], and Bolton, Scheinkman, and Xiong [2006]).

examining the effect of vesting period changes on firm outcomes is unlikely to yield causal estimates of the effect of incentive horizon on managerial myopia. The reason is that corporate boards set the vesting schedule of annual equity grants, and they may adjust vesting durations to match the timeframe of future investment opportunities. Therefore, an empirically observed association between shorter vesting periods and reduced investment may be due not to myopia, but instead to (unobservable) changes in a firm's investment environment.

To overcome this challenge, we examine firms that accelerated the vesting of executive stock options in order to avoid accounting charges under FAS 123-R. This landmark accounting standard, adopted by the Financial Accounting Standards Board (FASB) in December 2004, required for the first time all firms to expense stock option grants according to their fair value. Prior to FAS 123-R, firms did not have to factor the cost of stock option compensation into accounting earnings. Importantly, FAS 123-R affected not only new option grants, but also generated retroactive expenses for not fully vested options that were granted *years before* the standard's adoption. However, FASB allowed firms to avoid an accounting charge on these previously granted options by accelerating them to fully vest before FAS 123-R's compliance date.[2] As a result, more than 700 firms, including about 15% of S&P 1500 firms, in 2005 accelerated most previously granted stock options to vest immediately, instead of over several years as originally scheduled. This generated an average accounting savings equal to 23% of net income (Choudhary, Rajgopal, and Venkatachalam [2009])[3], but also caused the largest ever decrease in unvested equity holdings at these firms (see Figure 2).

The key element of our identification strategy is that FAS 123-R's compliance date differed across firms in an almost random manner. This is crucial because the decision to accelerate option vesting could be correlated with omitted variables that also affect investment. In particular, firms with high growth opportunities likely invest more than other firms. These firms also tend to rely heavily on stock option compensation to incentivize managers (e.g. Murphy [2003]), and as a result may be more likely to accelerate option vesting. Such heterogeneity between accelerating and non-accelerating firms, if unobserved, would bias empirical estimates of the effect of option acceleration on investment.

[2] FASB required firms to claim an accounting charge when accelerating in-the-money unvested options. However, this charge was smaller than the options' fair-value expense and many firms accelerated both in- and out-of-the-money options.

[3] This response is consistent with previous evidence showing that firms adjust compensation policies to increase accounting earnings (Hall and Murphy [2003], Carter, Lynch, and Tuna [2007]).

(Growth opportunities, which are difficult to control for (Roberts and Whited [2013]), would bias OLS coefficients upward.)

We account for such heterogeneity by adopting an instrumental variables strategy, exploiting the fact that FAS 123-R took effect for each firm in the first *fiscal* year starting after June 15, 2005. Specifically, we use firms' fiscal year ends in calendar year 2005 as an instrument for the decision to accelerate.[4] This is a valid instrument because firms with fiscal year ending in June or later were more likely to accelerate option vesting in 2005—they had to begin expensing options already in that year, while firms with fiscal year ending May or earlier could delay expensing until calendar year 2006. Furthermore, most firms' fiscal years were set many years before FAS 123-R, and hence should be unrelated to investment opportunities in 2005. We confirm the validity of our instrument by showing that many observable firm characteristics, including corporate investment, did not vary across fiscal year ends *before* FAS 123-R's adoption. Our sample also excludes the few firms that changed their fiscal year.

We start our analysis by showing that firms with fiscal year ending between June and December were 78% more likely to accelerate option vesting in calendar year 2005 than firms with fiscal year ending between January and May, with first-stage *F*-statistics well above 10. Furthermore, the economic effect of acceleration on executive incentive horizons was large. Executives at accelerating firms experienced a sharp 52% decrease in unvested equity incentives, while executives at non-accelerating firms experienced no change. In the following year, accelerating firms' CEOs increased option exercises sixfold—including early-stage options that most likely were accelerated—and sold most of the resulting shares. Option acceleration therefore substantially decreased executives' incentive horizons and allowed them to benefit from acceleration monetarily by reducing their holdings of firm equity.

We then examine whether shortened incentive horizons led executives to behave myopically by reducing investment. Our primary measure of corporate investment is capital expenditures, but we also present results for other discretionary expenditures such as R&D and advertising expenses. We use industry-adjusted investment rates to control for differences across industries. Myopic executives may have incentives to boost the short-term stock price by reducing investment, and exploit this situation by increasing their proceeds from exercises of accelerated stock options. Cutting capital expenditures may

[4] This identification strategy is similar to van Binsbergen, Graham, and Yang [2010], who use variation in firms' fiscal year endings to identify the effect of the 1986 Tax Reform Act on firms' marginal costs of debt. Variation in fiscal year endings is also used in Daske et al. [2008], who exploit that IFRS applied to firms at different points in time depending on fiscal year ends to estimate the effect of IFRS on liquidity. Michels [2013] exploits variation in fiscal year endings to study the effect of disclosure versus recognition.

temporarily increase the stock price as it increases a firm's free cash flows, which financial analysts often use to generate valuation multiples or to directly value firms in Discounted Cash Flow models.[5] Cutting capital expenditures also boosts earnings by reducing depreciation charges and interest expenses (if investment is funded by debt). Other expenditures such as R&D are directly expensed in the income statement, so cutting these investments increases net income and earnings-based multiples. Importantly, we will show that our results hold for broadly defined measures of investment that affect both cash flows and earnings.

Investment is also a likely target of myopia, because managers can adjust it relatively quickly. The majority of managers surveyed by Graham, Harvey, and Rajgopal [2005] reported they would reduce investment or delay projects to meet earnings targets *in the same quarter*. At the same time, analysts may not immediately deduce the long-term costs of reducing investment, because they do not directly observe firms' investment opportunities. In particular, they may not view investment delays as particularly costly. Therefore, investment cuts can lead to short-term overvaluation of firms.

Our instrumental variables estimation shows that option acceleration had a strong negative effect on capital expenditures in 2005. Specifically, our 2SLS estimates suggest that a one-standard deviation increase in the percentage of options accelerated due to an earlier FAS 123-R compliance date led firms to reduce industry-adjusted investment rates by .006 in 2005. This equals 12% of the investment variable's standard deviation, and implies a $3 million decrease in investment relative to the industry average for the median accelerating firm. Investment cuts were therefore sizeable, but managers could plausibly achieve them in the year that options were accelerated, perhaps in some cases by delaying instead of cancelling projects.[6]

If this investment reduction is due to myopic decisions, then the effects of option acceleration should be weaker among better-governed firms. Prior work shows that industry competitiveness is an important external governance mechanism (e.g., Giroud and Mueller [2010, 2011]), and indeed we find that investment cuts occur only among firms operating in less competitive industries (measured by the

[5] Free cash flows are typically measured as EBIT x (1 – corporate tax rate) + Depreciation – Capital Expenditures + Net Changes in Working Capital (see Damodaran [2006]).

[6] Because FASB allowed option acceleration in October 2004 and adopted FAS 123-R shortly thereafter, managers likely anticipated by late 2004 or early 2005 that their options may be accelerated, even if boards sometimes did not officially approval acceleration until relatively late in the fiscal year. (Managers also may have instigated consideration of option acceleration at their firms.) Therefore, managers likely had a reasonable timeframe to cut or postpone investment.

Herfindahl index). This is consistent with our hypothesis, as firms that face fierce product market competition may quickly go out of business if they reduce investment, and executives might not benefit from myopia even in the short term. We find that investment cuts are also concentrated among firms followed by few financial analysts, which is consistent with analyst coverage serving as an external monitoring mechanism and mitigating the extent to which executives can manipulate stock prices.

We further show that option acceleration led executives to cut other discretionary expenditures that directly affect earnings. We document a statistically significant and economically meaningful decrease in advertisement spending. We also find that R&D expenditures decrease, though the effect is not statistically significant at conventional levels (*t*-statistic of 1.62).[7] This weaker result could be due to low statistical power from many missing observations, or because managers at some firms believe that cutting R&D signals poor investment opportunities (Bebchuk and Stole [1993]). Taken together, our results indicate that executives responded to option acceleration by reducing investments that depress earnings or cash flows in the short run.

We rule out potential concerns with our analysis by showing that our results are robust to placebo tests and alternative specifications. The placebo tests show that it is unlikely that our results are biased by unobserved fixed differences across firms' fiscal year ends. Specifically, we show that no relationship exists between the instrumented 2005 acceleration decision and investment in the years before FAS 123-R's adoption. This indicates that firms with fiscal year ending June or later reduced investment only when they had to comply with FAS 123-R. Any remaining unobservable bias would have to affect only firms with fiscal years ending in June or later *and* cause investment to decrease *specifically* in 2005. Our results are further robust to using different windows of analysis around the FAS 123-R compliance date, controlling for various compensation and governance variables, or using non-industry adjusted investment rates together with industry-year fixed effects. We also do not find that accelerating firms simply substitute from purchasing to leasing long-term assets. Finally, we show that accelerating firms underperformed the stock market on a risk-adjusted basis by about 14% over the

[7] We cannot find any effects of option acceleration on discretionary accruals. A possible explanation for this is that option acceleration occurred shortly after Section 404 of the Sarbanes-Oxley Act (SOX) came into effect in 2004. At this time, managers faced heighted scrutiny from regulators, accountants, and the public, and new legal sanctions imposed higher risks on managers who conducted potentially fraudulent earnings management. As a result, since the passage of SOX accruals-based earnings management has declined substantially, while real earnings management, which is likely harder to detect, has increased (e.g., Cohen, Dey, and Lys [2008], Lobo and Zhou [2006], Iliev [2010]). This is consistent with our findings.

two-year period after 2005. This suggests that shareholders were eventually harmed by option acceleration and the resulting reductions in investment.

While our empirical setting allows us to cleanly identify the effect of accelerated option vesting on investment (high internal validity), this naturally comes at the expense of external validity. Because variation in FAS 123-R's compliance date affected firms' probability of option acceleration, our 2SLS estimates identify the effect of acceleration on investment only for firms that were considering option acceleration when the compliance date was set. In other words, our identification strategy estimates the Local Average Treatment Effect (LATE), but does not provide information on the effect of shortening incentive horizons among firms that would not have accelerated options under any circumstances. Nevertheless, our evidence is important because little is known about how managerial incentive horizon affects investment in *any* set of firms.

Our paper contributes to a growing empirical literature that links firm policies to executive horizons. Gopalan et al. [2013] develop a novel measure of equity vesting duration and document that it is positively correlated with investment opportunities, long-term assets, and R&D intensity. Edmans, Fang, and Lewellen [2014] measure executive horizon using the amount of equity that vests over the coming year. Consistent with our findings, they document that imminent vesting of equity incentives is associated with lower spending on capital expenditures, R&D, and advertisement. Gao, Hsu, and Li [2014] compare public and private firms and find that public firms, whose executives face more pressure to deliver short-term results, show more exploitative and less exploratory innovation strategies. Similarly, Asker, Farre-Mensa, and Ljungqvist [2014] find that public firms not only invest less, but are also less sensitive to investment opportunities than private firms, especially in industries where stock prices are most sensitive to earnings news. Our paper is also related to Xu [2012], who uses data from CEO employment contracts to show that shorter horizons can lead to better acquisitions. A key difference between these papers and ours is that by using an exogenous accounting rule change, we can precisely identify the timing of a horizon change (the large one-time shock to equity vesting) and establish its causal effect on investment.

We also add to a growing body of evidence that accounting standards affect real firm outcomes.[8] Previous work finds that the accounting treatment of stock options affects firms'

[8] For example, Graham, Hanlon, and Shevlin [2011] show how accounting income tax expenses affect subsidiary location decisions and profit repatriation, Marquardt and Wiedman [2007] show how a loophole in FAS 128 affects

compensation policies (Carter and Lynch [2003], Carter, Lynch, and Tuna [2007]). We show that such accounting changes also affect firm investment, through their direct effect on managerial incentives. Using a similar approach, Hayes, Lemmon, and Qiu [2012] test whether the shift from options to restricted stock following FAS 123-R affected firm risk. Their analysis does not examine changes in executive incentive horizon and does not exploit the differential timing of FAS 123-R's effective date.

The rest of this paper is structured as follows. Section 2 provides background on FAS 123-R. Section 3 explains our data and identification strategy. Section 4 shows how the timing of FAS 123-R affected option acceleration. Section 5 presents the main results on the effect of incentive horizon on investment. Section 6 provides robustness checks and extensions, and Section 7 concludes.

2. Background on FAS 123-R

FAS 123-R was the product of a decades-long debate on how to expense stock option compensation in accounting statements. To the extent relevant for our identification, this section provides a brief description of this debate, with a timeline of major events in Appendix A-2. Additional information is in Choudhary, Rajgopal, and Venkatachalam [2009], Balsam, Reitenga, and Yin [2008], and Murphy [2013].

The initial accounting treatment of stock options was set in 1972 by the Accounting Principles Board in Opinion 25. APB 25 ruled that the accounting expense for options with a clearly defined vesting schedule is based on the option's intrinsic value—the firm's stock price on the option's grant date minus the option strike price. Firms that granted options with strike price equal to the grant-date stock price (i.e. "at-the-money" options) therefore did not have to claim any accounting expense.

FASB first considered changing this accounting treatment in the mid-1980s, but tabled its proposal within two years. In June 1993, it released another proposal requiring firms to expense the fair value of stock options. This proposal attracted substantial opposition from accounting firms and industries that relied heavily on stock options to compensate employees. In March 1994, more than

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contingent convertible bond issuance, and Dechow and Sloan [1991] and Bens, Nagar, and Wong [2002] highlight instances in which firms reduce investment to boost earnings. Additionally, several papers show that FAS 123-R affected firms' financial reporting choices (Choudhary [2011], Bartov, Mohanram, and Nissim [2007] or Barth, Gow, and Taylor [2012]).

4,000 employees from numerous Silicon Valley firms held a rally to protest FASB's proposal, and in May 1994 the U.S. Senate passed a resolution urging FASB to abandon the proposal. In response to such opposition, FASB adopted a watered-down version of the proposal in October 1995. FAS 123 encouraged firms to adopt fair-value accounting, but allowed them to continue using the standard in APB 25 as long as the pro forma cost of option compensation was disclosed in a footnote to their financial statements. The vast majority of firms continued to use APB 25.

The perceived role of stock options in the corporate scandals of the early 2000s renewed momentum for changes to their accounting treatment. Starting in the summer of 2002, a number of firms voluntarily adopted fair-value accounting. In March 2004, the FASB once more released a proposal mandating that all firms use this standard, and the proposal was adopted as FAS 123-R in December 2004. FAS 123-R required all public firms except small business issuers to begin expensing stock options using the fair-value method in their first financial statements (typically quarterly 10-Q reports) released after June 15, 2005. However, on April 14, 2005 the Securities and Exchange Commission delayed the effective date to the first quarter of the fiscal year starting after June 15, 2005. In other words, the new effective date allowed companies to implement FAS 123-R at the beginning of the first fiscal year, instead of first reporting period, after June 2005. This meant that firms with fiscal year ending on June 30, 2005 had to expense stock options in the quarter starting in July 2005, while firms with fiscal year ending on May 31, 2005 did not have to expense stock options until the quarter starting in June 2006. Appendix A-3 illustrates the compliance rule behind FAS 123-R graphically. FASB said the delay was in response to concerns from accountants about already sizeable workloads and the difficulty that firms would face changing accounting standards in the middle of a fiscal year (McConnell et al. [2005]).

Importantly for our analysis, FAS 123-R required all firms to expense the fair value of *previously granted, unvested* stock options in addition to new options granted after the regulation's effective date. Because stock options typically vest over three to five years (Cadman, Rusticus, and Sunder [2013]), FAS 123-R required some firms to expense options they had granted in 2001—well before the regulatory change could have been anticipated. However, firms could exploit a loophole in this requirement by accelerating the vesting schedule of these options. FASB decided on October 6, 2004 that firms would not have to expense previously granted, out-of-the-money options that were accelerated to fully vest before the firm's FAS 123-R compliance date. The vast majority of firms that accelerated option vesting did so after this date (798 out of 820 firms in our sample). Although this paper focuses on the incentive horizon of top executives, firms accelerated options for all levels of employees.

FASB placed a few restrictions on option acceleration. Firms accelerating in-the-money options had to claim an expense equal to the difference between the stock price on the acceleration date and the option strike price. For options that were not deep in the money this expense was smaller than the options' fair value, so some firms accelerated both in- and out-of-the-money options (Balsam, Reitenga, and Yin [2008]). Section 4 shows that acceleration led to the single-largest decrease in top executives' unvested options, and that executives responded by substantially increasing option exercises and equity sales in the year after acceleration. This indicates that firms did not just accelerate deep out-of-the-money options, but also accelerated options that conveyed potentially strong incentives to executives.

3 Data, Empirical Specification, and Identification

3.1 Sample and Data

We identify firms that accelerated option vesting using the R.G. Associates Option Accelerated Vester Database. FASB required firms to disclose option acceleration to shareholders. R.G. Associates collected its data from these company disclosures, including 8-Ks (filings of material events), 10-K annual reports, and press releases. (Appendix A-4 contains an excerpt of a sample filing.) The database contains information on 969 acceleration events by 860 firms, occurring between May 2004 and February 2006. The database includes not only the date of option acceleration, but also the total number of options accelerated. For about half of the acceleration events, information is available for whether the firm restricted selling of the underlying stock until after the original vesting date.

Our sample consists of all Compustat firms listed on the New York Stock Exchange or NASDAQ.[9] We start with an initial sample of 6,033 firms in calendar year 2005. We then omit 493 firms that voluntarily expensed the fair value of options prior to FAS 123-R, 125 firms that changed their fiscal year between 2002 and 2006, and 42 firms that explicitly restricted employees from selling the underlying shares from accelerated options until after the original vesting date. We exclude firms that voluntarily adopted fair-value accounting as their expense recognition indicates that they are likely different from accelerators (Aboody, Barth, and Kasznik [2004]). We omit firms that changed their fiscal years to addresses the concern that firms with the greatest investment needs selectively postponed compliance with FAS 123-R by changing their fiscal year. We exclude firms with selling restrictions because option

[9] We cannot match 40 accelerating firms from the R.G. Associates database to Compustat.

acceleration likely does not reduce incentive horizons at these firms, as executives cannot unwind their incentives more quickly than before acceleration. Our final sample contains 5,373 firms, including 549 firms that accelerated option vesting in calendar year 2005 (10.2% of sample firms). The set of accelerators includes 254 firms that are in ExecuComp, representing about 15% of firms in this database.

FASB required all firms to comply with FAS 123-R in the first quarter of the first full fiscal year starting after June 15, 2005, and our identification strategy exploits that firms' fiscal years start at different points in *calendar* time. Our analysis focuses on the effects of option acceleration on investment in calendar year 2005, because this is when FAS 123-R first took effect. We also include observations from calendar year 2004 in some of our tests to provide a benchmark for each firm in the year before FAS 123-R took effect. (Table 9 shows that our main results are robust to using just calendar year 2005.) We use the variable *Late Fiscal Year End* to measure whether a firm is required to comply with FAS 123-R in a particular calendar year. In calendar year 2005, this variable equals 1 for firms with fiscal year ending June or later, and 0 for firms with fiscal year ending May or earlier. In regressions that include calendar year 2004, the variable equals 0 for all firms in that year.

The effectiveness of our identification strategy depends on our sample containing enough variation in firms' fiscal year ends. Table 1 Panel A presents the distribution of fiscal year ends for our sample in calendar year 2005. Although the majority of firms' fiscal years follow the calendar year, hundreds of firms have fiscal years ending in other months. In particular, the variation in fiscal year ends is sufficiently large that our control group of firms with fiscal years ending between January and May contains more than 500 firms (11% of the sample).

Our primary measure of option acceleration is *Pct. Options Accelerated*, which represents the percentage of options that are accelerated. This variable is defined as the total number of options accelerated divided by a firm's total number of (unvested and vested) options outstanding at the beginning of the fiscal year; data limitations prevent us from scaling by total unvested options.[10] The variable is set equal to 0 for all firm-years in which option vesting is not accelerated. *Pct. Options Accelerated* is constructed using aggregate option data, because the Accelerated Vester Database

[10] Ideally, we would like to use the number of *unvested* options outstanding at the start of year *t* in the denominator of *Pct. Options Accelerated*. However, the Compustat data necessary to calculate this measure are only available for firms with fiscal years ending June 2005 or later, so we can only use this measure for descriptive purposes. Nevertheless, we believe that this does not affect our analysis, as the correlation between *Pct. Options Accelerated* and the alternate variable scaled by unvested options is .72 among firms for which both measures are available.

contains only the number of options accelerated for all employees. The variable should nevertheless accurately measure the effect of acceleration on an executive's option holdings, because many of a firm's total options outstanding are held by executives—at the median ExecuComp firm, top executives hold 32% of options outstanding. Furthermore, because options are almost always granted at the money, the options held by executives and non-executive employees should have incurred a similar accounting expense under FAS 123-R and thus been accelerated in equal proportion. Our results do not change if we instead use an indicator variable, *Accelerate*, to denote whether a firm accelerated option vesting in the calendar year. Data on the number of accelerated options is available for 476 of the 549 firms that accelerated option vesting in 2005.

Table 1 Panel B presents the distribution of option acceleration events across time. The panel shows that, next to the 549 firms that accelerated option vesting in calendar year 2005, one firm accelerated option vesting in calendar year 2003, 55 in calendar year 2004, and 25 in the first two months of calendar year 2006 (22 firms accelerated option vesting in multiple years). The panel also shows mean values of the number of accelerated options divided either by all outstanding or all unvested options. Accelerated options constitute 21% of all outstanding options for the average firm in 2004, 26.5% in 2005, and 24% in 2006. The panel also shows that in 2005 and 2006, firms accelerated the majority of unvested options (59.1% and 50.3%, respectively). These numbers indicate that option acceleration affected a large portion of executives' option holdings. The next sections show that most of the accelerations in calendar year 2005 were done by firms required to comply with FAS 123-R in that year, and that option acceleration led to an unprecedented decrease in executives' incentives from unvested equity.

3.2 Identification Strategy

Ideally we would test our hypothesis that firm investment is related to executive incentive horizon using the following model for firm *f* at time *t*:

$$y_{f,t} = \theta * accel_{f,t} + \beta * x_{f,t-1} + \mu_t + \varepsilon_{f,t} \qquad (1)$$

where $y_{f,t}$ is a measure of firm investment in calendar year *t*, $accel_{f,t}$ is the acceleration variable *Pct. Options Accelerated* in *t*, $x_{f,t-1}$ is a vector of other firm characteristics (described in detail in Section 4.1), and μ_t is a year fixed effect.

However, inferring causality from this model is complicated by the fact that the determinants of a firm's decision to accelerate option vesting may also be related to investment, potentially inducing bias in the estimate of θ. One or more elements of $x_{f,t-1}$ might simultaneously cause some firms to accelerate options and to invest less. If any of these variables is empirically unobservable, it can bias estimates of θ and lead us to incorrectly conclude that reduced incentive horizon induces myopic behavior.

To overcome this challenge, we rely on the variation in the FAS 123-R compliance date across firms for identification. This variation caused some firms to benefit more from accelerating option vesting in calendar year 2005 than others. To see why, consider two firms—one with fiscal year ending in June, the other with fiscal year ending in May—for which reporting high earnings is equally important. In calendar year 2005, the firm with fiscal year ending in June could accelerate option vesting to boost accounting earnings by the fair value of its unvested options (potentially minus a charge for the intrinsic value of in-the-money options). On the contrary, acceleration would not affect the earnings of the firm with fiscal year ending in May 2005, because FAS 123-R did not require the firm to claim any expense for unvested options until calendar year 2006. Therefore, firms with fiscal year ending May or earlier benefitted less from accelerating option vesting in calendar year 2005, because (i) they could delay acceleration until the following calendar year; and (ii) these firms' previously granted, unvested options were more likely to finish vesting under their normal schedule before FAS 123-R took effect. The key features of this identification strategy are that FAS 123-R retroactively affected options granted *before* the regulation was adopted, and that the variation in benefits from acceleration is related to firms' fiscal year ends, which were set years prior to FAS 123-R's adoption.

We implement our identification strategy by using *Late Fiscal Year End* as an instrument for the decision to accelerate stock options in the following Two-Stage Least Squares (2SLS) model:

$$accel_{f,t} = \pi_1 * Late\ Fiscal\ Year\ End_{f,t} + \pi_2 * x_{f,t-1} + \mu_t + u_{f,t} \qquad (1^{st}\ \text{Stage})$$

$$y_{f,t} = \gamma_1 * \widehat{accel}_{f,t} + \gamma_2 * x_{f,t-1} + \mu_t + v_{f,t} \qquad (2SLS)$$

where $\widehat{accel}_{f,t}$ is the fitted value of *Pct. Options Accelerated* from the 1st stage regression.[11] The coefficient of interest in this model is γ_1. A negative value for this coefficient would indicate that firms

[11] We industry-adjust investment but do not include industry fixed effects in the 2SLS regressions, because in some industries only a small percentage of firms accelerated option vesting. Including industry fixed effects can

that were induced to accelerate options by the earlier FAS 123-R compliance date also reduced investment. This would support our hypothesis that the reduction in incentive horizon due to option acceleration led to myopic behavior.

Throughout this paper we focus on the effect of option acceleration on investment in calendar year 2005. We cannot cleanly identify the effect of option acceleration on investment in 2006, because we have no control group of firms unaffected by acceleration in 2006. Firms with fiscal year ending May or earlier had to comply with FAS 123-R in 2006, and some indeed accelerated option vesting, potentially encouraging their executives to decrease investment. However, at firms with fiscal year ending June or later, option acceleration from the previous year may have led executives to continue reducing investment in 2006. Because executives at all firms may have been motivated to act myopically, we are unable to differentiate the effect of option acceleration decisions in 2006 on contemporaneous investment from the effect of option acceleration in 2005 on subsequent investment. (Furthermore, because the Accelerated Vester Database ends coverage in February 2006, we do not observe all acceleration decisions made by firms with fiscal year ending May or earlier.)

3.3 Validity of Key Identifying Assumptions

In order for γ_1 to identify the causal effect of acceleration on investment, two key assumptions must be satisfied (see Angrist and Pischke [2009]):

1. Relevance Condition: $\pi_1 \neq 0$. This means that $accel_{f,t}$ must be correlated with $Late\ Fiscal\ Year\ End_{f,t}$ after controlling for other firm characteristics $x_{f,t-1}$.

2. Exclusion Restriction: $Cov(Late\ Fiscal\ Year\ End_{f,t}, v_{f,t}) = 0$. This means that differences in the FAS 123-R compliance date across firms must only affect corporate investment through their effect on option acceleration. In particular, there must not be any unobservable differences between firms with fiscal year ending before and after June that affect investment in 2005.

We will provide evidence supporting the Relevance Condition, by showing that FAS 123-R's compliance date is a strong predictor of the decision to accelerate option vesting in calendar year 2005, even after controlling for a wide range of variables that previous work has linked to firms' acceleration

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therefore substantially reduce the variation in the explanatory variable based on option acceleration. Our results however are largely unchanged when we directly account for industry effects and do not industry-adjust investment (see Column (10) in Table 9).

decisions. We cannot explicitly test the Exclusion Restriction that firms' fiscal year ends are uncorrelated with unobservable variables affecting investment, but we provide evidence that this is likely by showing that many observable firm characteristics are similar across fiscal year ends, and by conducting placebo tests that indicate that investment did not differ across our treatment and control firms in years prior to FAS 123-R's adoption (see Table 8).

Table 2 presents means and medians for a wide range of firm characteristics, separately for firms with fiscal year ending May or earlier (early fiscal year ends) and firms with fiscal year ending June or later (late fiscal year ends). The statistics are for fiscal-year-end values that firms report during the calendar year 2003, the year prior to FAS 123-R's adoption in December 2004.[12] The *t*-statistics reported in the final column are for the differences in mean values between firms with early and late fiscal years. Importantly, the table shows that in years prior to FAS 123-R, firms with late fiscal years had investment patterns that are economically similar, and statistically indistinguishable, from those of firms with early fiscal years. Other important variables that could affect investment also do not vary significantly across fiscal year end, including *Assets* and *Negative Interest Coverage*.

A few firm characteristics do vary across fiscal year end. We therefore control for these characteristics in all of our regressions and provide results based on a sample of firms that are matched exactly on these characteristics.[13] Moreover, the Exclusion Restriction can only be violated if firms with fiscal year ending June or later happen to be relatively more affected by some unobservable variable that reduces investment *specifically in calendar year 2005.* Furthermore, most firm characteristics that differ in Table 2, including *Debt/Assets* and *Cash Flow/Assets*, are statistically indistinguishable among firms with fiscal years ending between March and August. Our main results do not change when the analysis is restricted to this narrower window of firms, for which the option acceleration decision is also most likely to be random (see Column (2) of Table 9). Because firm's fiscal years were set years prior to the adoption of FAS 123-R, and observable investment characteristics are similar across our treatment and control group, the Exclusion Restriction is likely satisfied.

[12] For example, assets for calendar year 2003 are from firms' financial statements for fiscal years ending between January and December 2003.

[13] Note that the *Book-Market Ratio* is smaller among firms with late fiscal years. This suggests that these firms have higher growth or investment opportunities, and thus should invest *more* than firms with earlier fiscal years. This would bias our estimates against finding a negative effect of option acceleration on investment.

3.4 Informativeness of 2SLS Estimates

If the effect of acceleration on investment varies across firms (i.e., γ_1 is not constant but heterogeneous), then our 2SLS estimates can only identify the Local Average Treatment Effect (LATE).[14] This is likely the case in our study. Most firms that had to comply with FAS 123-R in calendar year 2005 could have reduced accounting expenses by accelerating options, but many decided not to do so. For some firms, this was likely because the cost of reducing executives' incentive horizons was particularly high. This suggests that the effect of acceleration on investment varies across firms, and that γ_1 is not a homogenous treatment effect.

In this case, our 2SLS estimates identify the effect of acceleration on investment only for the subsample of firms that were considering to accelerate options, and whose decision was ultimately determined by the FAS 123-R compliance date. Importantly, this LATE does not provide information on the effect of shortening incentive horizons among firms that would not have accelerated options under any circumstance, or among firms that would have accelerated options in calendar year 2005 whether or not FAS 123-R took effect then. Nevertheless, our estimates are useful because little is known about how managerial incentive horizon affects firm policy in *any* set of firms. Furthermore, it may be particularly important to understand how managerial myopia affects investment in firms that face cash constraints, and these firms are likely within the subset that was considering option acceleration.

4. Empirical Results: First Stage

In this section we present results for the first stage of our 2SLS model, which tests whether firms for which FAS 123-R took effect in calendar year 2005 were more likely to accelerate option vesting in that year. We also show that the decrease in executives' unvested equity holdings was large enough to plausibly affect their incentives to engage in myopic behavior, and that executives in fact responded by exercising more options and selling more equity.

[14] Our 2SLS framework only estimates the LATE if the Monotonicity Condition holds—firms that are affected by the FAS 123-R effective date are all affected in the same way. In order for this condition to hold, our sample cannot contain any firms with fiscal year ending in June or later that were planning to accelerate options when FAS 123-R was initially adopted, but then decided against acceleration when the FASB announced that these firms would be affected earlier than others. Monotonicity is likely satisfied as the primary reason to accelerate options was to avoid an accounting expense (see, for example, the filing by Sun Microsystems in Appendix A-4).

4.1 Effect of Fiscal Year Ends on Option Acceleration

Figure 1 shows that firms with fiscal year ending June or later were much more likely to accelerate option vesting in calendar year 2005. The figure shows, for each month of calendar year 2005, the fraction of firms with fiscal year ending in that month that accelerated option vesting. Option acceleration clearly increased when FAS 123-R took effect. Just 6% of firms with fiscal year ending in May 2005 or earlier (unaffected by FAS 123-R) accelerated option vesting in 2005. On the contrary, 10.7% of firms with fiscal year ending in June 2005 or later (affected by FAS 123-R) accelerated option vesting in 2005. This difference is statistically significant at the 1% level, and indicates that affected firms were 78% more likely to accelerate options than unaffected firms.

Table 3 shows that this result holds after controlling for a variety of firm characteristics that may affect the acceleration decision. Columns (1) through (4) present estimates of logistic models, while Columns (3) through (6) present estimates from ordinary least squares (OLS) regressions. For the logistic regressions, the dependent variable *Accelerate* is an indicator equal to 1 if the firm accelerated option vesting in calendar year 2005, and 0 otherwise. In the OLS regressions, the dependent variable is *Pct. Options Accelerated*, the ratio of options accelerated to options outstanding. In all regressions the primary explanatory variable is *Late Fiscal Year End*. The table presents in Columns (1) to (5) cross-sectional regressions for calendar year 2005. Column (6) is the first-stage specification that we use in our main 2SLS analysis and includes calendar years 2004 and 2005.

Our firm-level control variables include firm size, measured by *Log(Assets)*, because larger firms grant managers a higher fraction of total compensation in equity-based pay (Gabaix and Landier [2008], Bebchuk and Grinstein [2005]). We control for *Book-Market Ratio* because value firms (high Book-Market Ratio) may benefit less from option acceleration than growth firms (low Book-Market Ratio), which are likely more financially constrained and face harsher penalties for missing earnings growth targets (Skinner and Sloan [2002]). We control for the annual *Stock Return* from the previous two years because previously granted, unvested options are more likely to be out of the money, and thus incur no acceleration expense, at firms that recently experienced lower stock returns.[15] We control for *Cash Flow/Assets* and *Accounting Loss* as previous research has shown that more profitable firms are less likely to make use of accounting choices that increase income (Lilien, Mellman, and Patena [1988],

[15] Recall that firms accelerating in-the-money options had to claim an expense equal to the difference between the stock price on the acceleration date and the strike price.

Balsam, Haw, Lilien [1995]). We use two variables to capture the effects of debt covenant constraints, because firms that are close to violating earnings-based covenants may be more likely to preserve earnings by accelerating option vesting. We include *Debt/Assets* because firms with larger debt ratios are more likely to face constraints from debt covenants (see Billet, King, and Mauer [2007]). In some tests we also control for *Negative Interest Coverage* as firms are more likely to breach a debt covenants if interest coverage ratios are lower.[16] Finally, in this table we include industry fixed effects to show that fiscal year ends affect option acceleration even within industries. All control variables are measured as of the fiscal year ending in calendar year 2004. For example, for firms with fiscal year ending in June, *Log (Stock Return) [t-1]* is measured from July 2003 to June 2004 and *Log (Total Assets) [t-1]* is total assets reported in June 2004. We define firm-level control variables in this manner throughout the paper. Correlations of key variables are reported in Appendix A-5.

The first column of Table 3, which does not include firm characteristics other than industry fixed effects, shows that firms for which FAS 123-R took effect in calendar year 2005 have (exp(.789)-1=) 120% higher odds of accelerating options than firms for which FAS 123-R did not take effect. This is virtually unchanged when firm-level controls are added in Column (2).

The OLS regressions show a similarly strong relationship between firms' fiscal year ends and *Pct. Options Accelerated*. In each regression, the relationship is statistically significant at the 1% level. Note that the coefficients on *Late Fiscal Year End* in these regressions look small at first glance because the regressions estimate the percentage of options accelerated *across all sample firms*. In terms of economic magnitudes, the estimate of Column (4) indicates that, across all sample firms, firms with late fiscal year endings accelerated 2.5% more options than firms with early fiscal years. This number equals about (2.5%/3.3%=) 72% of the acceleration variable's unconditional full sample mean of 3.3%. Therefore, an earlier FAS 123-R compliance date led to a substantial decrease in executive incentive horizon at affected firms.

Below each regression we present Kleibergen-Paap [2006] *F*-statistics, which test instrument strength in regressions with heteroskedasticity-robust standard errors. The *F*-statistics are generally well above the threshold of 10 that is commonly used to assess the quality of a first-stage regression (see Staiger and Stock [1997] and Stock, Wright, and Yogo [2002]). This suggests that our instrument is a

[16] Chava and Roberts [2008] show that interest coverage ratios are among the most widely used covenant restriction in debt contracts. We use a negative interest coverage dummy variable rather than the ratio of EBIT over interest expenses as the ratio is very skewed due to outliers, even if winsorized.

strong predictor for option acceleration, and that it satisfies the Relevance Condition. We acknowledge that the overall explanatory power of the first stage regressions is relatively low, which indicates that unobserved heterogeneity may be an important determinant of the acceleration decision; this is precisely why exogenous variation in the acceleration decision is necessary to test our hypothesis.

The firm-level controls in Table 3 indicate that larger firms are more likely to accelerate option vesting, but the coefficients on *Log (Assets Squared)* suggest that the relationship is concave in firm size. Our results confirm a negative relationship between stock returns and acceleration. As predicted, firms with higher book-to-market values and cash flows are less likely to accelerate option vesting. Surprisingly, we firms with higher leverage are less likely to accelerate. We find no relationship between option acceleration and negative interest coverage.

4.2 Effect of Option Acceleration on Executive Incentive Horizon

Table 3 provides strong evidence that the Relevance Condition holds for our instrument. However, if firms accelerated a small amount of options or only deep out-of-the-money options, then myopic decisions would generate few benefits to executives in the short term. We now document that this is not the case—option acceleration led to an economically meaningful decrease in executives' incentive horizons.

Figure 2 shows that acceleration led to an unprecedented decrease in top executives' incentive horizon. The figure shows over the period from 1995 to 2009 year-on-year changes in incentives from unvested equity, which includes stock options and restricted stock. We report percentage changes for the median top executive at firms that accelerated option vesting in calendar year 2005 and the median top executive at firms that did not accelerate option vesting in any year. Firms that accelerated option vesting in a calendar year different than 2005 are omitted from the analysis. This figure is restricted to ExecuComp firms, for which detailed data on executives' equity holdings is available. Incentives are defined as the dollar change in unvested equity incentives for a 1% change in the stock price (Hall and Liebman [1998]).

The figure shows that from 1995 to 2009, the trend in incentives from unvested equity is very similar for executives at accelerating and non-accelerating firms, *except* for calendar year 2005—precisely when most firms accelerated option vesting. In that year, executives at accelerating firms experienced a sharp 52% decrease in incentives from unvested equity, while executives at non-

accelerating firms experienced no change. This difference is larger than in any other year, and was a larger shock to executives' unvested equity than even the decrease experienced during the 2008 financial crisis (50% decrease). Furthermore, the decrease is for total unvested equity incentives, indicating that both restricted stock (which was not affected by FAS 123-R) and non-accelerated in-the-money options did not provide a substantial buffer against the decrease in incentive horizon. In unreported results, we observe a similar pattern for the dollar value of unvested equity holdings, and also for the dollar value/incentives of just unvested stock options.

Appendix A-6 confirms the effect of option acceleration on executives' holdings of unvested equity in a regression framework for the year 2005. The table shows that executives at accelerating firms experience a large, statistically significant decrease in the dollar value of unvested options and equity in 2005. Results are similar if we look at changes in unvested option and equity incentives. For example, Column (8) shows that executives at accelerating firms experienced a 44% decrease in incentives from all unvested equity relative to executives at non-accelerating firms.[17]

One potential concern with our analysis is that accelerating firms granted top executives new equity with longer vesting periods to replenish incentive duration. Figure 2 indicates this is unlikely to be the case—in 2006 unvested equity holdings are largely unchanged from the previous year, both for firms that accelerated and did not accelerate option vesting in 2005. Furthermore, Appendix A-7 presents regressions showing that the size and vesting duration of new equity grants did not increase for accelerating firms relative to non-accelerating firms. The table shows that in both the year of and year after option acceleration, accelerating firms did not replenish executives' unvested equity holdings relative to non-accelerating firms.

4.3 Executives' Response to Option Acceleration

We next show that executives responded to the large, sudden increase in exercisable option holdings by substantially increasing option exercises, and by selling most of the resulting shares. Furthermore, we present evidence that executives increasingly exercised exactly the type of options that firms likely accelerated. Acceleration therefore did more than just remove the vesting provision on stock options—it also reduced executives' equity holdings in the firm. This indicates that executives'

[17] Executives' incentive horizons may also depend on the likelihood of dismissal, or on promised pension payments (e.g., Sundaram and Yermack [2007]). These incentives are difficult to measure accurately, but they will not affect our results as long as changes to these incentives are unrelated to firms' fiscal year ends in 2005.

incentives to pursue decisions maximizing long-term firm value likely decreased after option acceleration, and it also suggests that incentives to undertake myopic decisions may have increased.

Figure 3 shows option exercise patterns for CEOs of accelerating and non-accelerating firms in the years surrounding FAS 123-R's adoption. The figure shows the annual dollar value of option exercises, measured as the difference between the firm's stock price on the exercise date and the option's strike price (summed over all options the CEO exercises during the year). The sample includes CEOs at all firms that are in both our baseline sample and the Thomson Insiders database of equity transactions. This sample includes S&P 1500 firms, but also many smaller firms.

The figure shows that CEOs of accelerating firms exercised substantially more options in calendar year 2006—the year when CEOs were first able to exercise most accelerated options—than in previous years. The average value of option exercises rose from about $0.13 million in 2005 to more than $0.85 million in 2006. At the same time, the size of option exercises by CEOs of non-accelerating firms was largely unchanged. This result is consistent with Murphy [2013], who states on page 14 that "the 'spike' in exercise gains in 2006 likely reflects companies accelerating the exercisability of options."

Using the same sample, Figure 4 shows the dollar value of stock sales following option exercise, separately for CEOs of accelerating and non-accelerating firms. The figure shows a large increase in equity sales in 2006 for CEOs of accelerating firms. This confirms that these CEOs sold most of the stock they obtained from exercising options in the year after acceleration.

Table 4 provides further evidence that CEOs quickly exercised accelerated options and sold stock. The table uses a "difference-in-differences" analysis comparing option exercises by CEOs of accelerating and non-accelerating firms, before and after calendar year 2005. The sample is the same as in Figure 3 and 4. The dependent variable in the first two columns, *Log(Exercised Option Value)*, measures the dollar value of option exercises in each calendar year. In these two columns, the positive and statistically significant coefficient on the interaction term *Accelerating Firm* x *After 2005* indicates that CEOs of accelerating firms exercised more options after 2005 than CEOs of non-accelerating firms. This result is obtained after controlling for many firm-level characteristics, as well as CEO tenure and incentives from total equity holdings (the latter is available for only ExecuComp firms).

Next, Column (3) shows that accelerating firms' CEOs increasingly exercised exactly the type of options that firms likely accelerated. While we do not observe precisely which option grants were

accelerated, the options most likely had eight to ten years until expiration in calendar year 2005.[18] Such options would be seven to nine years from expiration in 2006, and six to eight years from expiration in 2007. We therefore generate the indicator *Early Option Exercise* that equals 1 if in a given year the CEO exercised at least one option with this time until expiration. We find that accelerating firms' CEOs were more likely to exercise such early-stage options after 2005 than non-accelerating firms' CEOs. In Column (4), the dependent variable *Log(Sold Shares Value)* measures the dollar value of shares sold following option exercise. The positive coefficient on the interaction term in this column shows that accelerating firms' CEOs sold most of the shares obtained from exercising options, confirming the results in Figure 4.

One potential concern with these results is that CEOs of accelerating firms may have increased option exercises throughout the years surrounding FAS 123-R's adoption, perhaps because their option compensation was increasing over time. This would violate the "parallel trends" assumptions underlying difference-in-differences tests. We rule out this possibility by conducting a placebo analysis in Columns (5) and (6), in which we repeat the difference-in-differences analysis but now compare option exercises by accelerating and non-accelerating firms' CEOs before and after 2002 (i.e., three years before these firms accelerated any options). The dependent variable in Column (5) is *Log(Exercised Option Value)* and in Column (6) it is *Early Option Exercise*. The coefficients on the interaction term *Accelerating Firm* x *After 2002* are statistically indistinguishable from 0, indicating that option exercise patterns of accelerating and non-accelerating firms' CEOs were similar before 2005. Therefore, the increase in accelerating firms' option exercises occurred *precisely in the year* when executives could first exercise accelerated options.

5. Empirical Results: Main Effect on Investment

This section presents our main results, showing in a 2SLS framework that firms that accelerated option vesting also reduced corporate investment. We further show that this reduction is concentrated among firms in industries with low competition, and among firms with low analyst following. We then show that accelerated option vesting affects not only capital expenditures, but also discretionary expenses such as advertisement and R&D expenditures, which directly affect earnings.

[18] Most options vest incrementally over the three to four years after their grant date (Cadman, Rusticus, and Sunder [2013]), and expire after ten years. Therefore, options with seven or fewer years until expiration in calendar year 2005 may have already vested fully, and thus would not have to be expensed under FAS 123-R or accelerated.

5.1. The Effect of Option Acceleration on Investment

We measure investment as capital expenditures divided by total assets. For each firm-year observation, we adjust this measure by subtracting the mean investment rate of firms in the same industry in the same fiscal year, to account for differences in investment patterns across industries. We label the resulting variable *Ind.-adj. Capex/Assets*.

Table 5 presents our main results. Columns (1) to (6) examine the relationship between option acceleration and contemporaneous investment, and Column (7) examines whether acceleration affects investment in the following year. In all regressions we measure the amount of options accelerated using *Pct. Options Accelerated,* except for Column (6) which uses *Accelerate*, the dummy variable that equals one if a firm accelerated option vesting.[19] We report OLS regressions in Columns (1) to (2), and in the other columns we present 2SLS estimates using *Late Fiscal Year End* to instrument for option acceleration. The sample period for each regression is calendar years 2004 and 2005. The regressions control for various firm characteristics that may affect option acceleration or corporate investment, including variables that may differ across firms with different fiscal year ends (see Table 2). We measure each control variable using financial information reported in the previous calendar year to ensure that the controls are not affected by FAS 123-R.

The OLS regressions in Columns (1) and (2) in Table 5 provide no evidence that firm that accelerate option vesting invest less than firms that do no accelerate—the coefficient on *Pct. Options Accelerated* is statistically indistinguishable from zero in each regression. However, when we instrument *Pct. Options Accelerated* using fiscal year end dates, we find strong evidence that option acceleration leads managers to reduce investment. The regressions in Columns (3) through (4) show a negative and highly statistically significant relationship between acceleration and investment. This relationship remains negative when we control in Column (5) for negative interest coverage, to account for the possibility that acceleration and investment decisions are undertaken to avoid violating debt covenants (sample size is about 30% smaller in this model). The regressions in Column (6) show that our results do not change if we use the *Accelerate* instead of *Pct. Options Accelerated*. The 2SLS results do not appear to be affected by weak instrument problems, because the Kleibergen-Paap [2006] *F*-statistics are in all specifications well above 10.

[19] Regressions without controls in Columns (1) and (3) are estimated for the sample of firms for which we have control variables (see Columns (2) and (4)). We do this to facilitate the interpretation of how the controls affect the size of the coefficient on *Pct. Options Accelerated*.

In terms of economic magnitude, the -.282 coefficient on *Pct. Options Accelerated* in Column (4) indicates that a one-standard deviation increase in the percentage of options accelerated due to an earlier FAS 123-R compliance date (i.e., a .02 increase in $\widehat{accel}_{f,t}$ in the 2SLS framework) leads to an absolute decrease of (-.282*.02=) .006 in contemporaneous industry-adjusted capital expenditures. This equals about 12% of the variable's standard deviation of .051 in the years 2004 and 2005. For the median accelerating firm (total assets of $499 million), this is equal to a (.006*$499=) $3 million decrease in investment relative to the industry average. Such investment cuts are economically meaningful, but managers can also plausibly achieve them in the same year that options are accelerated (perhaps by delaying some projects instead of cancelling them outright).

The difference between the OLS and 2SLS coefficients on *Pct. Options Accelerated* could be due to accelerating firms having higher growth or investment opportunities than non-accelerating firms. Firms with good growth opportunities, possibly situated early on in their firm life cycle, likely have higher investment rates than more mature firms. These firms also are more likely to benefit from option acceleration, as they tend to rely heavily on stock option compensation to incentivize managers (e.g., Murphy [2003]). Growth opportunities are difficult to control for (e.g., Roberts and Whited [2013]), and if such an omitted variable is positively correlated with investment and option acceleration, it will bias OLS coefficients upward and cancel out the negative effect of myopia.[20]

Column (7) shows that the relationship between acceleration and subsequent investment is negative, with a coefficient that is substantially smaller in absolute magnitude and statistically insignificant. As explained in Section 3.2, it is difficult to draw inferences from this result. The coefficient on *Pct. Options Accelerated* could indicate that option acceleration in 2005 had a weaker effect on subsequent than contemporaneous investment. It could also indicate that firms with fiscal year ending May or earlier that accelerated option vesting in 2006 cut investment in that year by a similar amount to firms with fiscal year ending June or later that accelerated option vesting in 2005.

Appendix A-8 provides reduced form estimates from regressions of *Ind.-adj. Capex/Assets* directly on the instrument *Late Fiscal Year End.* The regressions show that the instrument is negatively correlated with investment in 2005, which indicates that firms that have late fiscal years in 2005 spend

[20] The OLS coefficient on *Pct. Options Accelerated* is larger than the 2SLS coefficient, which is consistent with positive bias (i.e., the estimated regression coefficient is higher than the true effect). An omitted variable can induce positive bias if it is positively correlated with both investment and option acceleration, or negative correlated with both.

less on investment in that year. This is consistent with the economic intuition behind our instrument. As explained in Angrist and Pischke (2009), it would be problematic to find that the coefficient on the instrumental variable has a sign that is inconsistent with the instrument's expected causal effect.

5.2 Option Acceleration and Investment: Governance Effects

Executives that face strong external governance are less likely to benefit from myopic actions. Intense product market competition, for example, can discipline executives to pass up private benefits and focus on generating long-term shareholder value (Giroud and Mueller [2010, 2011]). In highly competitive industries, a firm that myopically cuts investment quickly falls behind its competitors, and its executives can lose their jobs if the firm subsequently experiences distress or bankruptcy. Myopia may also be tempered if managers are exposed to the disciplinary effects from the market for corporate control, because myopic actions may subject firms to takeover threats that can cost executives their jobs. The presence of such external governance mechanisms can therefore reduce executives' benefits from myopic actions, and may discipline them to continue focusing on valuable long-term investment even when vesting durations decrease.[21] Similarly, prior work shows that analysts can enhance governance by monitoring managers or by reducing information asymmetry, which benefits activist investors and other monitors (e.g. Chen, Harford, and Lin [2009]). Furthermore, when analyst coverage is high managers may be less likely to succeed in hiding the long-term costs of myopic behavior from investors (Yu [2008]).

In Table 6 we test whether firms that face strong external governance engage in less myopic actions after accelerating option vesting. We do this by re-estimating our 2SLS specifications on samples partitioned by different measures of external governance. For each measure, we present results for firms with below-median values of external governance, and for firms with above-median values. The number of accelerating firms is roughly equally distributed across high- and low-governance subsamples. Below the coefficient estimates, we report *p*-values from a test that compares the coefficient on *Pct. Options Accelerated* across the high versus low subsamples.[22]

[21] Some work argues that firms with many anti-takeover provisions are better insulated against short-term pressures by financial markets, and hence may undertake more innovation (Chemmanur and Tian [2013], Sapra, Subramanian, and Subramanian [2013]). However, option acceleration affects executive horizons through a different channel, and may potentially lead to myopia even in firms insulated from investor pressure.

[22] In order to test whether the difference in coefficients is statistically significant, we estimate a 2SLS regression on the full sample and include an interaction term of *Pct. Option Accelerated* and an indicator variable that equal one

In columns (1) and (2) we partition our sample into firms that operate in industries with low and high competition. We follow Giroud and Mueller [2011] by measuring industry competitiveness using the Herfindahl Index of firms' market share in each 3-digit SIC code industry. Market share is measured using annual sales. Herfindahl values are inversely related to industry competition, so column (1) presents results for firms in industries with above-median Herfindahl values (low competition) and column (2) presents results for firms operating in industries with below-median values (high competition). The results in Column (1) show that for firms facing low competition, the coefficient on *Pct. Option Accelerated* is -.46 and statistically significant at the 5% level. For firms facing high competition, the coefficient is substantially smaller and statistically indistinguishable from 0. Furthermore, the difference between these coefficients is statistically significant at the 1% level. These results indicate that firms facing intense competition are less likely to reduce investment after option acceleration, which is consistent with product markets supplying external governance that limits myopic behavior.

In columns (3) through (6), we partition the sample into firms with above- and below-median values of two indices of anti-takeover provisions. The G-Index, developed by Gompers, Ishii, and Metrick [2003], measures the number of a firm's anti-takeover mechanisms. The E-Index examines the subset of the six most important provisions of the G-Index (Bebchuk, Cohen, and Ferrell [2009]). Higher index values represent greater managerial power and weaker shareholder rights. The reason is that managers in firms with many anti-takeover provisions face weaker disciplinary effects from the market for corporate control and thereby have lower incentives to maximize shareholder wealth. Both indexes have been widely used in the literature to proxy for corporate governance (e.g., Giroud and Mueller [2011], Ferreira and Laux [2007], Masulis, Wang, and Xie [2007]). Data for these two indices is only available for firms in the RiskMetrics database (mostly S&P 1500 firms). The number of observations in regressions (3) through (6) is therefore substantially smaller than for our main results, reducing the statistical power of our tests.

The regressions show that for firms with high G-Index values (low external governance), the coefficient on *Pct. Option Accelerated* is negative and statistically significant at the 10% level, while for firms with low G-Index values (high external governance) it is indistinguishable from 0. This difference is economically large as the coefficient is about three times larger for firms with high G-Index values, but

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for firms in the high governance subsample. We then instrument not only *Pct. Option Accelerated* but also the interaction term of *Pct. Option Accelerated* and the governance indicator (using *Late Fiscal Year End* times the governance indicator as our second instrument) (see pages 235-236 of Wooldridge [2002]).

the difference between coefficients is not statistically significant (*p*-value of .165). The results that partition the sample based on the E-Index are generally weaker than those that use the G-Index.

In Columns (7) and (8), we examine whether the number of financial analysts following a firm affects the extent to which option acceleration leads to myopia. We split our sample into firms with below- and above-median analyst coverage in calendar year 2005. The coefficient on *Pct. Option Accelerated* is negative and statistically significant (10% level) only for firms with low analyst coverage, and the difference between coefficients is significant at the 5% level. This is consistent with financial analysts mitigating the extent to which executives can benefit from myopically reducing investment.

Overall, the results in Table 6 indicate that external governance can counteract the effect of option acceleration on executives' incentive horizons.[23] The boards of firms with strong external governance may have approved option acceleration because they anticipated that external governance would mitigate myopia. The results in Table 6 also tentatively speak to the question whether the decrease in investment at accelerating firms was inefficient for long-term shareholders. This question is difficult to answer as investment reductions are not necessarily suboptimal if a firm overinvested prior to the investment cut.[24] Our result that the effects of option acceleration are concentrated among firms with worse external governance is consistent with the view that the documented investment cuts were indeed inefficient.[25] However, we are careful not to overinterpret these results as we are unable to directly measure the investment opportunities of the projects that were cut or delayed in 2005.

[23] In unreported regressions, we also examine the role of internal governance mechanisms, especially the fraction of independent board directors. We do not find significant evidence that our results differ across firms with different levels of board independence. One possible reason for this is that board independence rose dramatically in the early 2000s following the passage of the Sarbanes-Oxley act and stock exchange regulations (e.g., Chhaochharia and Grinstein [2009]). Furthermore, this analysis is limited to only 254 accelerating firms at S&P 1500 firms, making it difficult to detect any meaningful differences.

[24] Moreover, myopic incentives are not automatically inefficient as executives with shorter incentive horizons may be more likely to terminate inefficient projects (Laux [2012]), or take actions that increase the speculative component of the stock price and benefit short-term shareholders (Bolton, Scheinkman, and Xiong [2006]).

[25] In unreported regressions, we cannot detect that firms with better governance showed higher levels of investment prior to FAS 123-R. In fact, firms with more analyst coverage and firms exposed to more competition seem to spend somewhat more on capital expenditures prior to the accounting rule change. Though this does not provide conclusive evidence, it suggests that it is unlikely that the fall in investment in poorly governed firms reduces inefficient overinvestment.

5.3 Option Acceleration: Effects on Advertisement and R&D Expenses

Executives whose incentive horizon decreases due to option acceleration may engage in myopic actions by reducing other types of discretionary spending in addition to capital expenditures. In particular, executives may attempt to boost the stock price in the short term by cutting either R&D or advertisement spending. Both are expensed directly on firms' income statements, so reducing these discretionary expenditures immediately leads to higher earnings. This can boost the firm's stock price in the short term, as analysts who use earnings-based multiples may increase their valuation of the firm. At the same time, these expenditures typically yield benefits only years into the future—research projects can take years to complete and their outcome is highly uncertain, while developing brand awareness among consumers often requires repeated marketing efforts. Therefore, reducing R&D or advertisement spending allows executives to report higher earnings, and markets may not be able to immediately determine whether the reductions are suboptimal.

Prior work has linked reductions in R&D to managerial myopia, caused by short-term pressure from shareholders (Bushee [1998]). Mizik and Jacobson [2007] document that firms reduce marketing expenditures around seasoned equity offerings to report earnings higher than normal. Artz and Mizik (2014) find that equity compensation can cause Chief Marketing Officers to pursue myopic marketing policies. Moreover, Graham, Harvey, and Rajgopal [2005] find that 80% of surveyed top executives state that they would decrease discretionary spending on R&D, advertising and maintenance to meet an earnings target. In addition, there is evidence that the stock market is unable to properly value R&D (e.g., Cohen, Diether, and Malloy [2013]) as well as advertisement expenditures (e.g., Mizik [2010]). It is hence plausible that option acceleration also leads to reductions in these types of spending.

Table 7 presents 2SLS regressions similar to Column (4) of Table 5. Column (1) shows a negative relationship between option acceleration and industry-adjusted advertising expenditures, significant at the 5% level. Column (2) shows a negative relationship also between option acceleration and industry-adjusted R&D spending, but the coefficient on *Pct. Options Accelerated* is not statistically significant at conventional levels (*t*-statistic of -1.62). Note that the number of observations in Columns (1) and (2) is substantially smaller than for regressions examining capital expenditures, because many firms do not report advertising or R&D expenses. One reason for the weaker results on R&D could be that some managers believe that a cut in R&D signals poor investment opportunities (Bebchuk and Stole [1993]).

Columns (3) and (4) examine the effect of option acceleration on capital expenditures combined with either advertisement spending or R&D; the latter is sometimes used as a measure of broad discretionary investment. We find a negative relationship between option acceleration and these combined spending measures. The coefficient in Column (4) is an economically large -.694 and significant at the 1% level. The coefficient in Column (5) is -.802 and significant at the 5% level.

The economic effect of option acceleration on advertisement and R&D spending is similar in magnitude to the effect on capital expenditures. The regressions in Columns (1) and (2) indicate that a one-standard deviation increase in *Pct. Options Accelerated* due to earlier FAS 123-R compliance date leads to a .007 decrease in the industry-adjusted advertisement spending rate (19% of the variable's standard deviation), and a .011 decrease in industry-adjusted R&D (8% of the standard deviation). A standard-deviation increase in *Pct. Options Accelerated* also leads to a .017 decrease in *Ind.-adj. (Capex/Assets + R&D/Assets)*, equal to 12% of the combined measure's standard deviation. Overall, these results show that acceleration of option vesting led executives to reduce multiple sources of corporate investment.

6. Robustness Checks and Extensions

In this section we show that the reduction in corporate investment due to option acceleration is robust to placebo tests and variations in our baseline empirical specification. Each of these variations addresses a potential concern with our analysis. We then show that the stock returns of firms that had to comply with FAS 123-R and accelerated option vesting underperformed after 2005.

6.1 Placebo Tests

One concern with our analysis is that firms with different fiscal year ends differ based on unobservable characteristics that affect investment in 2005. In this case, our instrument would violate the Exclusion Restriction, and our 2SLS estimates may be driven by unobservable differences instead of the decrease in incentive horizon due to acceleration of option vesting.

To address this concern, in Table 8 we conduct placebo regressions examining whether our instrument affects investment in the two years prior to FAS 123-R's adoption by FASB in 2004, that is in the years 2002 or 2003. *Pct. Options Accelerated* and *Accelerate* are defined as in Table 5—they

measure whether firms accelerated option vesting in calendar year 2005. Likewise, our instrument *Late Fiscal Year End* equals 1 if the firm's fiscal year in 2005 ends in June through December, and 0 otherwise. If option acceleration caused the reduction of investment in 2005 only, then our instrumented acceleration variables should not be correlated with investment in 2002 or 2003—firms could not have anticipated the specific provisions of FAS 123-R at this time. On the other hand, if unobserved heterogeneity causes firms with fiscal year ending June or later to generally invest less, then a firm's fiscal year end should also explain investment in years prior to FAS 123-R's adoption. This falsification analysis thus allows us to perform a reasonable placebo test for our instrument.

Table 8 shows that no relationship exists between our instrumented acceleration variables and investment in 2002 or 2003. Only one of the coefficients on the acceleration variables is negative, and all are statistically indistinguishable from 0 with *t*-statistics well below 1. These results indicate that unobserved heterogeneity across firms with different fiscal year ends does not generally affect investment. Rather, firms with fiscal year ending in June or later cut investment only in 2005—exactly when executives' incentive horizons decreased due to FAS 123-R. To bias our results, an unobservable variable would have to affect only firms with fiscal years ending in June or later *and* cause these firms to decrease investment specifically in 2005.

In Appendix A-9 we estimate placebo regressions for the other expenditures from Table 7, and show that no relationship exists between instrumented option acceleration in 2005 and advertisement and R&D expenses prior to FAS 123-R.

6.2 Further Robustness Checks

Table 9 presents the results of several additional robustness checks. In Column (1), we examine the effect of option acceleration on investment for calendar year 2005 only. In Column (2), we restrict the sample to a narrow window of firms with fiscal year ending between March and August 2005. The number of observations in this regression is small, substantially reducing the statistical power of our tests, but the advantage of this test is that it compares only firms with fiscal year ending right around June 15, 2005 (when FAS 123-R first took effect for any firm). Further, these firms' key observable characteristics are almost all statistically indistinguishable in years prior to FAS 123-R, including *Debt/Assets* and *Cash Flow/Assets*. Our results for investment are robust to both narrower windows of analysis. (Our findings are also robust to excluding just December fiscal year-end firms.)

For the remaining columns in Table 9, the sample covers again calendar years 2004 and 2005. Column (3) shows that results are robust when we exclude financial services firms, for which the definition of capital expenditures may not be comparable to other firms. Regressions in Columns (4) through (8) add additional compensation and governance controls. In Column (4), for example, we control for executives' pay-for-performance incentives from total holdings of firm equity as incentive horizons (and myopic actions) may be driven not only by the value of accelerated options, but also by the value of other portfolio assets that constitute a large portion of an executive's wealth. Though the inclusion of additional controls reduces the sample size, results remain relatively robust.

The regression in Column (9) is for a matched sample of firms. We match propensity scores using a nearest neighbor procedure with replacement (as suggested by Roberts and Whited [2013]). We match accelerators and non-accelerators based on the variables that statistically differed across fiscal year ends in Table 2 (i.e., *Book-Market Ratio*, *Cash Flow/Assets*, *Debt/Assets*, *Accounting Loss*, and *Low Competition*). In this smaller matched sample, we continue to find a negative and statistically significant relationship for investment. Finally, Column (10) shows results that address the concern that estimates that use industry-adjusted dependent variables may be inconsistent when there is within-industry correlation among independent variables. As proposed in Gormely and Matsa [2013], we estimate regressions using non-industry adjusted capital expenditures over total assets as the dependent variable and control for industry-by-year fixed effects.

One additional concern is that instead of reducing investment, accelerating firms merely substitute rental expenditures for capital spending. If firms responded to option acceleration by renting or leasing long-term assets instead of purchasing them, a negative relationship might exist between option acceleration and *Ind.-adj. Capex/Assets*. This could lead us to mistakenly conclude that acceleration causes firms to behave myopically, when in fact the horizon of utilized assets may not decrease. In unreported results, we re-estimate the 2SLS regressions from Table 5 with industry-adjusted rental expenditures over total assets as the dependent variable. Rental expenses include operating lease expenses, payments for short-term leases, and contingent payments associated with capitalized leases (see Eisfeldt and Rampini [2009]). We find that firms that accelerated option vesting do not increase rental expenditures. This indicates that option acceleration led to a decrease in overall spending on capital assets.

6.3 Stock Returns Following Investment Cuts

We have provided robust evidence that firms that accelerated option vesting in 2005 due to an earlier FAS 123-R compliance date also reduced real investment. We close our analysis by investigating whether shareholders were eventually harmed as accelerating firms cut or delayed positive net present value investment projects. If investment reductions are inefficient and the stock market does not immediately recognize their long-term costs, then accelerating firms' stocks should eventually underperform the market.

To examine whether such underperformance indeed occurred, we calculate accelerating firms' risk-adjusted stock returns over the two-year period from January 2006 to December 2007. We use a relatively long analysis window because the market may only gradually learn about the value implications of the changes in investment policy (e.g., in terms of subsequently lower growth rates). We generate monthly cumulative abnormal returns for a size-weighted portfolio of accelerating firms using the CAPM model, the Fama-French 3-factor model, and the Carhart 4-factor model including momentum (Carhart [1997]). For comparison we also report accelerating firms' normal (i.e., non-risk-adjusted) returns.

Figure 5 shows that accelerating firms' stocks substantially underperformed the market over the two-year period after 2005. The figure shows that both normal and risk-adjusted returns initially rose in the first half of 2006—allowing managers to exercise accelerated options and sell their shares—but risk-adjusted returns turn negative in late 2006 and decrease throughout 2007. The Carhart 4-factor model suggests that accelerating firms underperformed by -13.6% from January 2006 to December 2007.[26]

This result provides tentative evidence indicating that the investment reductions induced by shortened incentive horizons eventually harmed shareholders. The precise magnitude of the stock return decrease should be interpreted with caution, as analysis of long-term stock returns suffers from the joint hypothesis problem (abnormal returns can be due to either poor firm performance or misspecification of the benchmark return model). Nevertheless, the pattern of returns in Figure 5 is consistent with myopia. Based on this evidence and our prior results, we believe that it is unlikely that the documented reductions in investment at firms that accelerated option vesting were efficient overall.

[26] Appendix A-10 shows that this underperformance is not just economically large but also statistically significant, for all three models of cumulative abnormal returns.

7. Conclusions

We investigate whether executives with more short-term horizons spend less on corporate investment. Though it is frequently claimed that executives act myopically, little empirical evidence exists on the effects of short-termism. This lack of evidence is due to the difficulty of constructing good proxies for changes in executive horizons, and to omitted variables that complicate the identification of the causal effect of incentive horizons on corporate policies.

We overcome the first challenge by looking at a sharp reduction in the vesting periods of executive options as a result of an accounting change in 2005. More than 700 U.S. firms accelerated the vesting periods on executive stock options to avoid an accounting expense under FAS 123-R. We use vesting periods to measure executive incentive horizon as they are the only explicit mechanism that most firms use to prevent executives from unwinding their equity incentives. For the median executive in our sample, option acceleration led to an unprecedented 52% decrease in unvested equity holdings. CEOs of accelerating firms responded by substantially increasing option exercises and equity sales.

To overcome the second challenge, we identify the effect of option acceleration on corporate investment by exploiting exogenous variation in the timing of FAS 123-R. Firms with fiscal year ending in June or later had to comply with FAS123-R already in 2005, while firms with fiscal year ending before June could postpone compliance until 2006. We therefore use firms' fiscal year end in 2005 as an instrument for the decision to accelerate. Firms with fiscal year ending in June to December 2005 were 78% more likely to accelerate option vesting than firms with fiscal year ending in January to May 2005.

We document that option acceleration in 2005 has a strong negative effect on industry-adjusted capital expenditures in the year of acceleration. In terms of economic significance, our 2SLS estimates suggest that a one-standard deviation increase in option acceleration due to an earlier FAS 123-R compliance date led firms to reduce industry-adjusted investment rates by 0.006 in 2005. This is equal to about 12% of the investment variable's standard deviation. We find that option acceleration led to investment cuts only in the least competitive industries and among firms with low analyst coverage. This indicates that external governance may mitigate the shock to executive horizon incentives, preventing some executives from acting myopically. We further show that option acceleration led executives to cut not only capital expenditures, but also advertisement and R&D expenditures, though the effect for the latter measure is not statistically significant at conventional levels.

Future research could look at how internal firm governance, especially boards and compensation committees, react to governance shocks such as the one resulting from option acceleration. Our analysis also points to possibly unintended real consequences that result from changes in accounting rules.

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Figure 1: The Effect of FAS 123-R on Acceleration of Option Vesting

This figure shows the percentage of firms with fiscal year ending in each month of calendar year 2005 that accelerated option vesting. The sample contains firms that trade on the New York Stock Exchange or NASDAQ. The sample excludes firms that voluntarily expensed the fair value of options prior to FAS 123-R, that changed fiscal year between 2002 and 2006, or that restricted employees from selling the underlying shares from accelerated options until after the original vesting date.

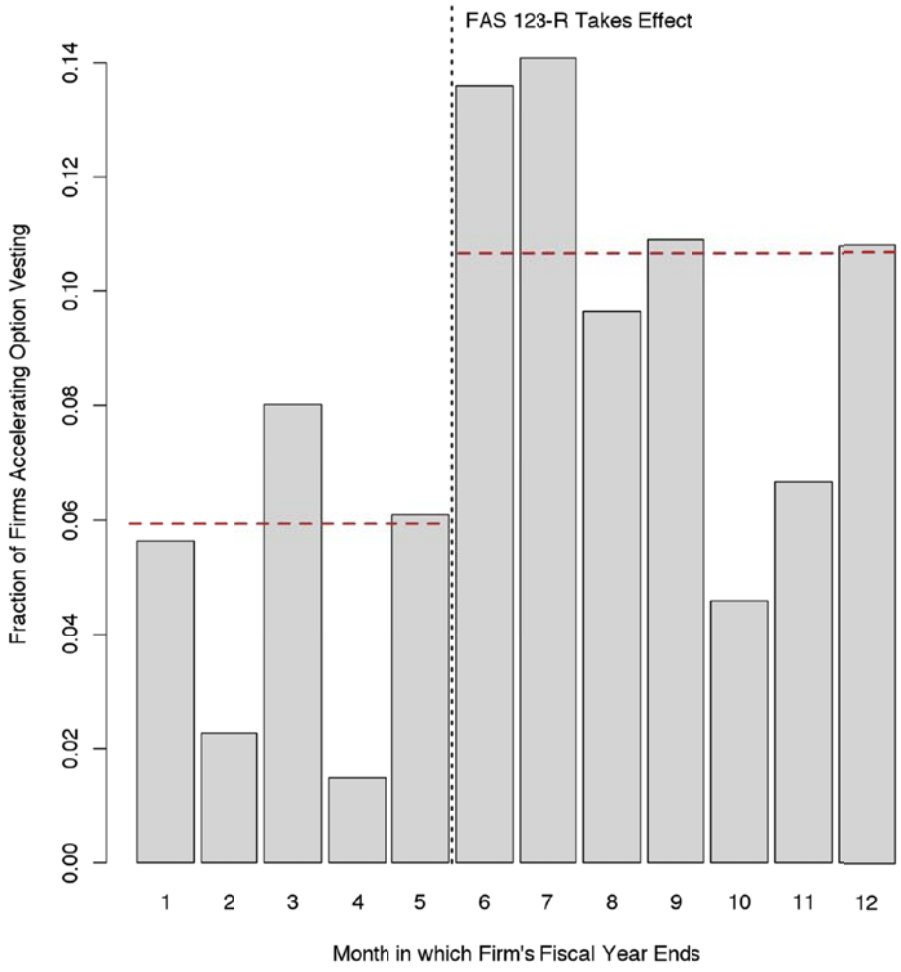


Figure 2: The Effect of Acceleration on Executive Incentive Horizon

This figure shows the year-on-year percentage change in unvested equity incentives. We report this figure separately for the median top executive at firms that accelerated option vesting in 2005 and for the median top executive at firms that did not accelerate option vesting in any year. Top executives are all executives that are listed in ExecuComp. Firms that accelerated option vesting in a calendar year different than 2005 are omitted. The sample contains firms that trade on the New York Stock Exchange or NASDAQ and are in ExecuComp in 2005. The sample excludes firms that voluntarily expensed the fair value of options prior to FAS 123-R, that changed fiscal year between 2002 and 2006, or that restricted employees from selling the underlying shares from accelerated options until after the original vesting date. Unvested equity incentives are measured as the change in the dollar value of unvested stock options and restricted stock for a 1% change in the stock price.

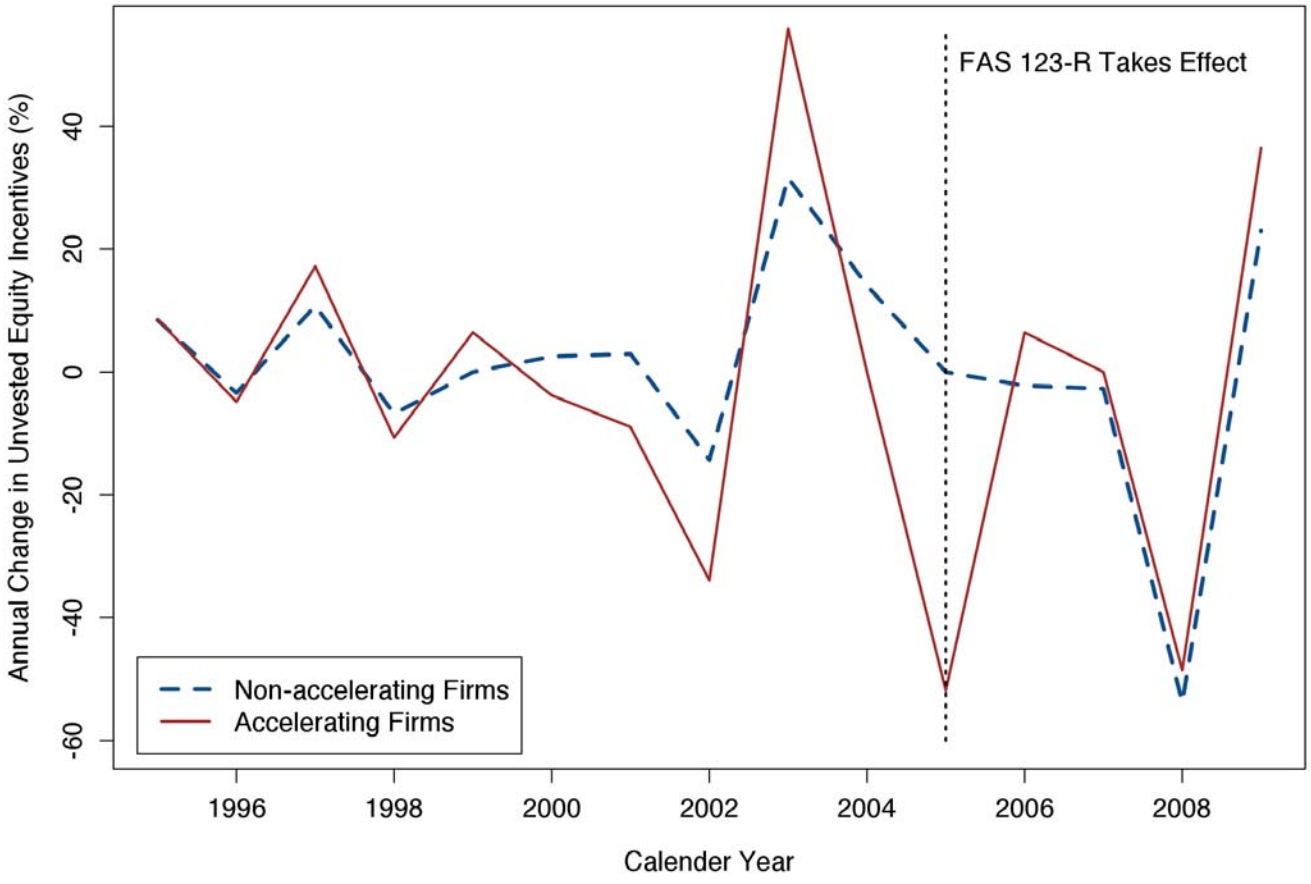


Figure 3: CEO Option Exercises in Response to Acceleration

This figure shows the average amount of options exercised over time by CEOs of firms that accelerated option vesting in 2005 and CEOs of firms that did not accelerate option vesting. The amount of options exercised is measured by first regressing, separately for CEOs of accelerating and non-accelerating firms, *Log(Exercised Option Value)* on *Log(Assets) [t-1]*, *Tobin's Q [t-1]*, *Log(Stock Returns) [t-1]*, *Log(Stock Returns) [t-2]*, and calendar year fixed effects. Then, the average value of options exercised is calculated from the coefficients on the year fixed effects. For each option, the dollar value of exercise is measured as the stock price on the exercise date minus the option strike price. Control variables are measured at each firm's fiscal year end. CEOs are identified based on Thomson Insiders' *Role Code* variable. We classify executives as CEOs if any level of *Role Code* equals CEO, or if the first level of *Role Code* equals P for President. The sample contains firms that trade on the New York Stock Exchange or NASDAQ and are in Thomson Insiders in 2005. The sample excludes firms that voluntarily expensed the fair value of options prior to FAS 123-R, that changed fiscal year between 2002 and 2006, or that restricted employees from selling the underlying shares from accelerated options until after the original vesting date.

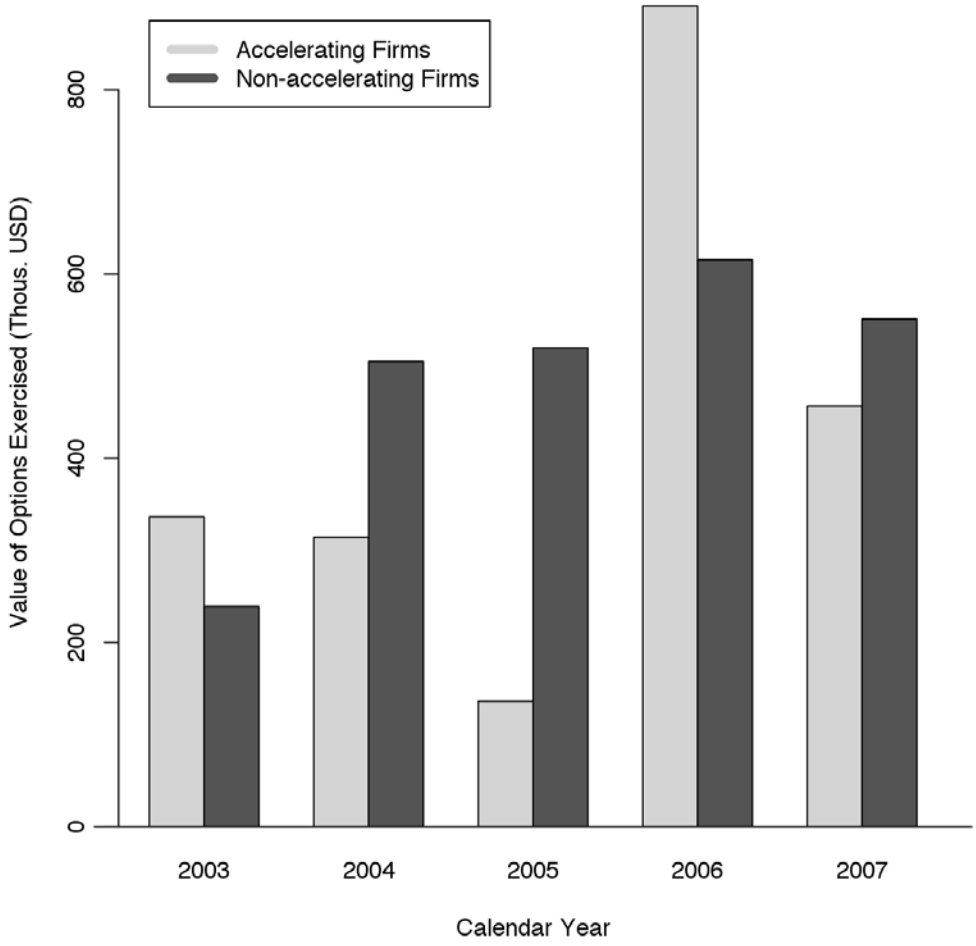


Figure 4: CEO Stock Sales in Response to Acceleration

This figure shows the average amount of stock sold following option exercise by CEOs of firms that accelerated option vesting in 2005 and CEOs of firms that did not accelerate option vesting. The amount of stock sold is measured by first regressing, separately for CEOs of accelerating and non-accelerating firms, *Log(Sold Shares Value)* on *Log(Assets) [t-1]*, *Tobin's Q [t-1]*, *Log(Stock Returns) [t-1]*, *Log(Stock Returns) [t-2]*, and calendar year fixed effects. Then, the average value of stock sold is calculated from the coefficients on the year fixed effects. The value of stock sales is the stock price on the sale date multiplied by shares sold, and is calculated only for shares sold following option exercise. Control variables are measured at each firm's fiscal year end. CEOs are identified based on Thomson Insiders' *Role Code* variable. We classify executives as CEOs if any level of *Role Code* equals CEO, or if the first level of *Role Code* equals P for President. The sample contains firms that trade on the New York Stock Exchange or NASDAQ and are in Thomson Insiders in 2005. The sample excludes firms that voluntarily expensed the fair value of options prior to FAS 123-R, that changed fiscal year between 2002 and 2006, or that restricted employees from selling the underlying shares from accelerated options until after the original vesting date.

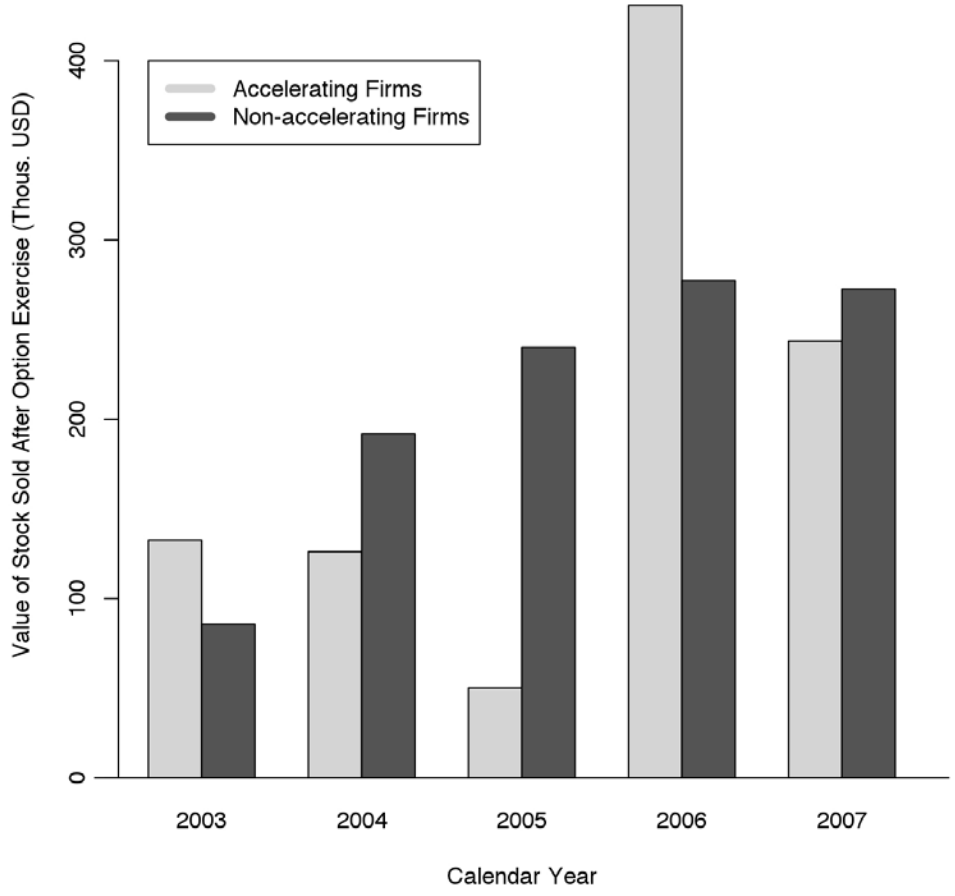


Figure 5: Stock Returns Following Investment Cuts

This figure shows cumulative monthly stock returns from January 2006 to December 2007 for firms that had to comply with FAS 123-R in calendar year 2005 and accelerated option vesting in that year. Accelerating firms are combined into a portfolio with monthly returns weighted by total assets. The figure shows the holding period rate of return for normal stock returns (i.e., unadjusted for risk). The figure also shows the cumulative abnormal stock return based on three different models: (i) CAPM; (ii) Fama-French 3-factor; and (iii) Carhart (1997) 4-factor including momentum. Estimation windows for these three models are (-48,-1) months before January 2006. Firms with fewer than 12 months of returns in the estimation window are omitted. The market return in these three models is the CRSP value-weighted market index. Monthly stock return data is also from CRSP.

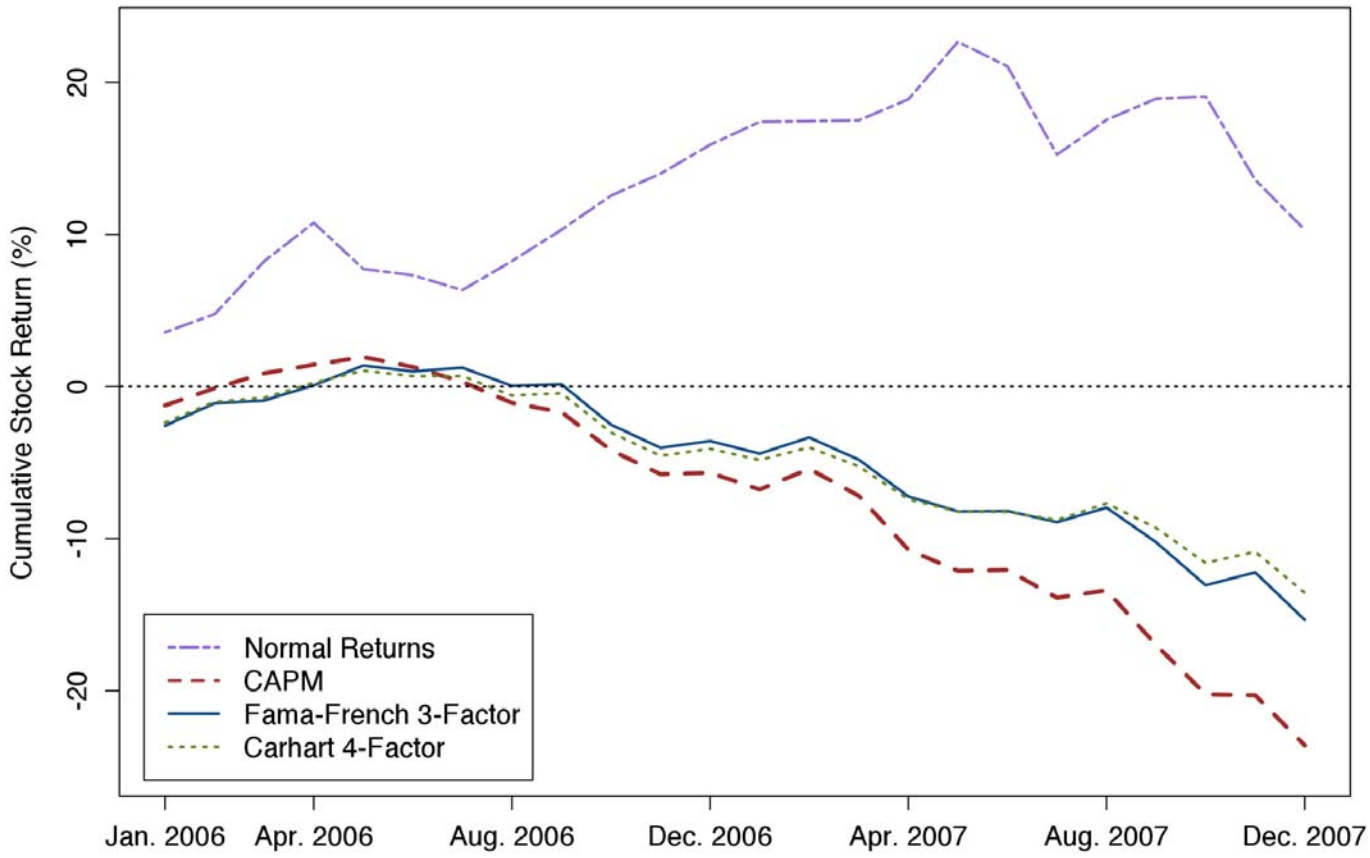


Table 1: Distribution of Fiscal Year Ends and Acceleration Events

Panel A shows the number of sample firms with fiscal year ending in each month in calendar year 2005. Panel B shows the number and percentage of sample firms that accelerate option vesting between 2003 and 2006. We further report the percentage of options accelerated (*Pct. Options Accelerated*), which is defined as the number of options accelerated divided by the number of (unvested and vested) options outstanding. For descriptive purposes, we also report the number of options accelerated divided by the number of *unvested* options outstanding (*Pct. Unvested Options Accelerated*). However, due to data limitations, this variable is only available for firms with fiscal years ending June 2005 or later. The correlation between *Pct. Options Accelerated* and *Pct. Unvested Options Accelerated* is .72 among firms for which both measures are available. The sample contains firms that trade on the New York Stock Exchange or NASDAQ. We exclude firms that voluntarily expensed the fair value of options prior to FAS 123-R, that changed fiscal year between 2002 and 2006, or that restricted employees from selling the underlying shares from accelerated options until after the original vesting date.

Panel A: Fiscal Year Ends

Fiscal Year Ends in 2005			
Fiscal Year End Month	**# Firms**	**Pct.**	**Cumulative Pct.**
January	143	2.7%	2.7%
February	44	0.8%	3.5%
March	241	4.5%	8.0%
April	68	1.3%	9.2%
May	82	1.5%	10.8%
June	274	5.1%	15.9%
July	72	1.3%	17.2%
August	83	1.5%	18.7%
September	276	5.1%	23.9%
October	199	3.7%	27.6%
November	76	1.4%	29.0%
December	3,815	71.0%	100.0%
Total	5,373	100%	

Panel B: Option Acceleration Events

Option Acceleration Events				
Calendar Year	**# Firms**	**Pct. of Sample Firms**	**Pct. Options Accelerated**	**Pct. Unvested Options Accelerated**
2003	1	0.0%	n/a	n/a
2004	55	1.0%	20.8%	n/a
2005	549	10.2%	26.5%	59.1%
2006	25	0.5%	24.2%	50.3%
Total	630		26.1%	58.7%

Table 2: Firm Characteristics across Fiscal Year Ends before FAS 123-R

This table compares firm characteristics for firms with fiscal year ending June or later (our treatment group) and firms with fiscal year ending May or earlier (our control group). The variables are reported for calendar year 2003, the year before FAS 123-R was adopted. For each group we report means, medians, and the number of observations. We further report *p*-values of a *t*-test of difference in means between the treatment and control group. The sample contains firms that trade on the New York Stock Exchange or NASDAQ. We exclude firms that voluntarily expensed the fair value of options prior to FAS 123-R, that changed fiscal year between 2002 and 2006, or that restricted employees from selling the underlying shares from accelerated options until after the original vesting date. Variables are calculated at fiscal year ends. Definitions of all variables are reported in Appendix A-1.

	Firm Characteristics in 2003						
	Early Fiscal Year End (January-May)			**Late Fiscal Year End (June-December)**			***t*-test (*p*-value)**
Variable	**Mean**	**Median**	**Obs.**	**Mean**	**Median**	**Obs.**	
Ind.-adj. Capex/Assets	0.001	-0.008	499	0.000	-0.011	3635	0.6567
Ind.-adj. Adv./Assets	0.004	-0.010	259	-0.001	-0.003	1671	0.1108
Ind.-adj. R&D/Assets	-0.004	-0.007	341	0.002	-0.016	2121	0.4406
Ind.-adj. (Capex/Assets + Adv./Assets)	0.008	-0.008	238	0.002	-0.013	1188	0.2387
Ind.-adj. (Capex/Assets + R&D/Assets)	-0.002	-0.023	339	0.001	-0.029	2110	0.6532
Book-Market Ratio	0.435	0.380	494	0.275	0.241	3711	0.0000
Assets ($m)	3690	349	524	3819	506	4233	0.8252
Cash Flow/Assets	0.063	0.090	490	0.034	0.071	3507	0.0042
Debt/Assets	0.180	0.121	520	0.217	0.165	4223	0.0004
Negative Interest Coverage	0.278	0.000	389	0.301	0.000	3029	0.3348
Low Competition	0.552	1.000	520	0.490	0.000	4178	0.0082
High G-Index	0.432	0.000	176	0.484	0.000	1056	0.2006
High E-Index	0.443	0.000	176	0.503	1.000	1056	0.1430
High Analyst Coverage	0.443	0.000	314	0.457	0.000	2086	0.6269

Table 3: Fiscal Year Endings and Option Acceleration: First-Stage Results

This table examines whether firms with fiscal year ending June or later are more likely to accelerate the vesting of stock options in response to FAS 123-R than firms with fiscal year ending May or earlier. The regressions in Columns (1) and (2) are logistic regressions and the regressions in Columns (3) to (6) are OLS regressions. Column (6) is the first-stage specification we use in our main 2SLS regressions. *Accelerate* is a dummy variable that equals 1 if a firm accelerated option vesting in calendar year 2005, and 0 otherwise. *Pct. Options Accelerated* is the number of options accelerated divided by the number of options outstanding. It is set equal to 0 for firms that do not accelerate. The key explanatory variable is *Late Fiscal Year End*, a dummy variable that equals 1 if FAS 123-R took effect for a firm in calendar year 2005, and 0 otherwise. Because the regressions in Columns (1) to (5) are for calendar year 2005 only, *Late Fiscal Year End* equals 1 for firms with fiscal year ending June or later, and 0 for firms with fiscal year ending May or earlier in these regressions. *F-Statistic* is the Kleibergen-Paap [2006] *F*-Statistic of our instrument. *# Accelerating Firms* is the number of firms in each regression that accelerated option vesting in calendar year 2005. *Marginal Probability* is the change in the probability of accelerating option vesting when *Late Fiscal Year End* changes from 0 to 1. The sample contains firms that trade on the New York Stock Exchange or NASDAQ. We exclude firms that voluntarily expensed the fair value of options prior to FAS 123-R, that changed fiscal year between 2002 and 2006, or that restricted employees from selling the underlying shares from accelerated options until after the original vesting date. All regressions include industry fixed effects based on the Fama-French 12 industry classification. Control variables are calculated at fiscal year ends. Definitions of all variables are reported in Appendix A-1. We report *t*-statistics in parentheses, which are based on White heteroskedasticity-consistent standard errors. ***, **, * indicate significance levels of 1%, 5%, 10%, respectively.

Dependent Variable:	**Accelerate**		**Pct. Options Accelerated**			
Model:	**Logit**		**OLS**			**OLS**
Sample:	**Calendar Year 2005**		**Calendar Year 2005**			**Calendar Years 2004-2005**
	(1)	(2)	(3)	(4)	(5)	(6)
Late Fiscal Year End	0.789***	0.696***	0.029***	0.024***	0.022***	0.023***
	(4.30)	(3.24)	(6.90)	(4.23)	(3.33)	(5.52)
Log(Assets) [t-1]		0.534***		0.014***	0.009*	0.010***
		(3.60)		(3.24)	(1.71)	(3.87)
Log(Assets Squared) [t-1]		-0.040***		-0.001***	-0.001**	-0.001***
		(-3.62)		(-3.57)	(-2.28)	(-4.33)
Book-Market Ratio [t-1]		-0.608**		-0.018	-0.008	-0.012*
		(-2.18)		(-1.52)	(-0.51)	(-1.79)
Log(Stock Return) [t-1]		-1.117***		-0.029***	-0.026***	-0.018***
		(-7.73)		(-5.24)	(-3.86)	(-5.41)
Log(Stock Return) [t-2]		-0.334**		-0.005	-0.005	-0.001
		(-2.47)		(-0.92)	(-0.77)	(-0.29)
Cash Flow/Assets [t-1]		-0.701**		-0.020	-0.013	-0.014**
		(-2.31)		(-1.55)	(-0.81)	(-1.97)
Debt/Assets [t-1]		-1.061***		-0.028***	-0.021*	-0.022***
		(-3.64)		(-2.69)	(-1.77)	(-3.74)
Accounting Loss [t-1]		-0.208		-0.001	-0.002	0.002
		(-1.32)		(-0.14)	(-0.15)	(0.63)
Negative Interest Coverage [t-1]					0.007	
					(0.49)	
Industry Fixed Effects	YES	YES	YES	YES	YES	NO
Obs.	5254	3338	3816	3084	2245	5130
Pseudo/Adj. R-sq.	0.032	0.062	0.011	0.026	0.027	0.047
F-Statistic (Late Fiscal Year End)	18.5	10.5	47.5	17.9	11.1	30.5
# Accelerating Firms	549	502	476	440	291	472
Marginal Probability	7%	8%				

Table 4: CEO Option Exercises and Equity Sales in Response to Option Acceleration

This table examines whether accelerating firms' CEOs increase options exercises and equity sales following option acceleration. Columns (1) to (4) present results from a difference-in-differences analysis that compares accelerating and non-accelerating firms, before and after calendar year 2005. Columns (5) and (6) conduct a placebo test of this analysis, comparing option exercises by CEOs of accelerating and non-accelerating firms, but before and after 2002 (when no options were accelerated). The sample contains CEOs from our sample firms that are also in Thomson Insiders. We identify CEOs in Thomson Insiders using the *Role Code* variable. We classify executives as CEOs if any level of *Role Code* equals CEO, or if the first level of *Role Code* equals P for President. *Log(Exercised Option Value)* is the natural logarithm of 1 plus the annual dollar value of options exercised. *Early Option Exercise* is a dummy variable that equals 1 if in a given calendar year a CEO exercises at least one option with seven to nine years until expiration (six to eight years in 2007 only), and 0 otherwise. This variable is based on the fact that most options accelerated in 2005 had at the time eight to ten years until expiration. *Log(Sold Shares Value)* is the natural logarithm of 1 plus the annual dollar value of shares sold following option exercise. *Accelerating Firm* is a dummy variable that equals 1 in all sample years for firms that accelerated option vesting in calendar year 2005, and 0 in all sample years for firms that did not accelerate option vesting in 2005. *After 2005* is a dummy variable that equals 1 for calendar years 2006 and 2007, and 0 for calendar years 2004 and 2005. *After 2002* is a dummy variable that equals 1 for calendar years 2003 and 2004, and 0 for calendar years 2001 and 2002. All regressions include industry fixed effects based on the Fama-French 12 industry classification. Control variables are calculated at fiscal year ends. Definitions of all variables are reported in Appendix A-1. We report *t*-statistics in parentheses, which are based on White heteroskedasticity-consistent standard errors. ***, **, * indicate significance levels of 1%, 5%, 10%, respectively.

Dependent Variable:	**Log(Exercised Option Value)**	**Log(Exercised Option Value)**	**Early Option Exercise**	**Log(Sold Shares Value)**	**Log(Exercised Option Value)**	**Early Option Exercise**
Model:	**OLS**					
Sample:	**Calendar Years 2004-2007**				**Calendar Years 2001-2004**	
	(1)	(2)	(3)	(4)	(5)	(6)
Accelerating Firm * After 2005	0.977**	1.355**	0.068***	1.156***		
	(2.53)	(2.40)	(2.96)	(2.69)		
After 2005	-0.101	-.126	-0.010	0.129		
	(-0.45)	(-0.41)	(-0.81)	(0.53)		
Accelerating Firm * After 2002					-0.198	-0.012
					(-0.49)	(-0.47)
After 2002					0.849***	0.012
					(3.97)	(1.01)
Accelerating Firm	-0.970***	-1.254***	-0.035**	-1.072***	0.138	0.003
	(-3.54)	(-3.10)	(-2.15)	(-3.52)	(0.47)	(0.16)
Log(Assets) [t-1]	1.465***	1.549***	0.075***	1.422***	1.381***	0.079***
	(7.93)	(2.88)	(6.62)	(6.88)	(7.98)	(7.97)
Log(Assets Squared) [t-1]	-0.043***	-0.086**	-0.004***	-0.038**	-0.045***	-0.005***
	(-3.06)	(-2.53)	(-4.10)	(-2.35)	(-3.17)	(-5.75)
Book-Market Ratio [t-1]	-2.821***	-2.698***	-0.078***	-2.575***	-2.389***	-0.066***
	(-6.55)	(-3.26)	(-3.13)	(-5.44)	(-8.09)	(-3.61)
Log(Stock Return) [t-1]	2.256***	2.881***	0.147***	2.336***	1.771***	0.088***
	(11.03)	(8.07)	(11.63)	(10.60)	(12.59)	(10.12)
Log(Stock Return) [t-2]	1.632***	1.794***	0.121***	1.418***	1.300***	0.055***
	(9.13)	(5.85)	(11.08)	(7.31)	(10.05)	(6.86)
Cash Flow/Assets [t-1]	1.998***	0.978	0.014	1.839***	0.132	-0.021
	(4.15)	(0.95)	(0.47)	(3.56)	(0.31)	(-0.80)
Debt/Assets [t-1]	-3.455***	-3.293***	-0.090***	-3.587***	-3.086***	-0.115***
	(-8.34)	(-4.62)	(-3.63)	(-7.90)	(-7.80)	(-4.88)
Accounting Loss [t-1]	-1.165***	-0.940**	0.005	-1.074***	-1.501***	-0.015
	(-5.37)	(-2.54)	(0.41)	(-4.63)	(-8.27)	(-1.42)
CEO Tenure	-1.984***	-2.665***	0.043***	-2.133***	-1.443***	0.042***
	(-10.40)	(-8.53)	(3.68)	(-10.46)	(-8.60)	(4.00)
Log(Annual Equity Pay)		0.131***				
		(4.97)				
Log(Total Incentives)		0.731***				
		(7.57)				
Industry Fixed Effects	YES	YES	YES	YES	YES	YES
Obs.	8555	4155	8522	7249	7861	7800
Adj. R-sq.	0.132	0.138	0.051	0.124	0.165	0.048

Table 5: Option Acceleration and Investment: Main Regression Analysis

This table examines whether firms that accelerated option vesting spent less on capital expenditures. The dependent variable *Ind.-adj. Capex/Assets* is capital expenditures over total assets, minus its mean value in the same industry and year. *Pct. Options Accelerated* is the number of options accelerated divided by total options outstanding. It is set equal to 0 for firms that do not accelerate. *Accelerate* is a dummy variable that equals 1 in the calendar year in which a firm accelerated option vesting. In calendar year 2004, it equals 0 for all firms. The regressions in Column (1) and (2) are OLS regressions, while those in Columns (3) to (7) are 2SLS regressions. 2SLS regressions instrument *Pct. Options Accelerated* and *Accelerate* using *Late Fiscal Year End*. In calendar year 2005, *Late Fiscal Year End* equals 1 for firms with fiscal year ending June or later, and 0 for firms with fiscal year ending May or earlier. In calendar year 2004, it equals zero for all firms. *F-Statistic* is the Kleibergen-Paap [2006] *F*-Statistic of our instrument from the corresponding first-stage regression (not reported). The sample contains firms that trade on the New York Stock Exchange or NASDAQ. We exclude firms that voluntarily expensed the fair value of options prior to FAS 123-R, that changed fiscal year between 2002 and 2006, or that restricted employees from selling the underlying shares from accelerated options until after the original vesting date. All regressions include calendar year fixed effects. Control variables are calculated at fiscal year ends. Definitions of all variables are reported in Appendix A-1. We report *t*-statistics in parentheses, which are based on White heteroskedasticity-consistent standard errors. ***, **, * indicate significance levels of 1%, 5%, 10%, respectively.

Dependent Variable:	**Ind.-adj. Capex/Assets [t]**		**Ind.-adj. Capex/Assets [t]**				**Ind.-adj. Capex/Assets [t+1]**
Model:	**OLS**		**2SLS**				**2SLS**
Sample:	**Calendar Years 2004-2005**		**Calendar Years 2004-2005**				**Calendar Years 2004-2005**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Pct. Options Accelerated	0.002	0.005	-0.210**	-0.282**	-0.296*		-0.079
	(0.25)	(0.70)	(-2.42)	(-2.52)	(-1.77)		(-0.80)
Accelerate						-0.090**	
						(-2.17)	
Log(Assets) [t-1]		-0.001		0.002	-0.002	0.003	-0.001
		(-0.40)		(0.85)	(-0.63)	(1.32)	(-0.28)
Log(Assets Squared) [t-1]		-0.000		-0.000*	-0.000	-0.000**	-0.000
		(-0.76)		(-1.88)	(-0.56)	(-2.16)	(-0.90)
Book-Market Ratio [t-1]		-0.019***		-0.023***	-0.024***	-0.020***	-0.019***
		(-6.76)		(-6.48)	(-5.65)	(-5.57)	(-5.58)
Log(Stock Return) [t-1]		0.002		-0.002	0.001	-0.002	0.001
		(1.52)		(-0.74)	(0.29)	(-0.64)	(0.33)
Log(Stock Return) [t-2]		0.003***		0.004***	0.005***	0.004***	0.004***
		(2.81)		(2.96)	(2.88)	(2.91)	(3.03)
Cash Flow/Assets [t-1]		0.038***		0.033***	0.045***	0.034***	0.037***
		(10.15)		(7.14)	(7.29)	(6.95)	(8.35)
Debt/Assets [t-1]		0.003		-0.003	-0.006	-0.005	0.005
		(0.85)		(-0.72)	(-1.25)	(-0.95)	(1.35)
Accounting Loss [t-1]		-0.005***		-0.004**	-0.004*	-0.005***	-0.004**
		(-3.55)		(-2.55)	(-1.65)	(-2.90)	(-2.35)
Negative Interest Coverage [t-1]					0.002		
					(0.60)		
Year Fixed Effect	YES	YES	YES	YES	YES	YES	YES
Obs.	5954	5954	5954	5954	4606	6555	5610
Adj. R-sq.	-0.000	0.040					
F-Statistic			51.27	37.15	16.28	18.45	33.51

Table 6: Option Acceleration and Investment: Governance Effects

This table examines for different sample splits whether firms that accelerated option vesting spent less on capital expenditures. The dependent variable *Ind.-adj. Capex/Assets* is capital expenditures over total assets, minus its mean value in the same industry and year. The regressions in Column (1) and (2) split the sample based on whether industry competition is low or high. *Low Competition* (*High Competition*) firms operate in industries with Herfindahl index values above (below) the sample median in a given year. The Herfindahl index is measured using sales and industries are classified using 3-digit SIC codes. The regressions in Column (3) and (4) split the sample based on whether the G-Index is high or low. *High G-Index* (*Low G-Index*) firms are firms where the G-Index is above (below) the sample median in a given year, indicating bad (good) corporate governance. The regressions in Column (5) and (6) replicate the previous regressions but use the E-Index instead of the G-Index to proxy for corporate governance. The regressions in Column (7) and (8) split the sample based on whether analyst following is high or low. *High Analyst Coverage* (*Low Analyst Coverage*) firms are those where the number of analysts that cover the firm is above (below) the sample median in a given year. *Pct. Options Accelerated* is the number of options accelerated divided by total options outstanding. It is set equal to 0 for firms that do not accelerate. The 2SLS regressions instrument *Pct. Options Accelerated* using *Late Fiscal Year End*. Below each set of regressions we report the *p*-value from a test of whether the coefficient on *Pct. Options Accelerated* differs between the high versus low subsamples. *F-Statistic* is the Kleibergen-Paap [2006] *F*-Statistic of our instrument from the corresponding first-stage regression (not reported). *# Accelerating Firms* is the number of firms in each regression that accelerated option vesting in calendar year 2005. All regressions include calendar year fixed effects. Control variables are calculated at fiscal year ends. Definitions of all variables are reported in Appendix A-1. We report *t*-statistics in parentheses, which are based on White heteroskedasticity-consistent standard errors. ***, **, * indicate significance levels of 1%, 5%, 10%, respectively.

Dependent Variable:	**Ind.-adj. Capex/Assets**							
Model:	**2SLS**		**2SLS**		**2SLS**		**2SLS**	
Sample:	**Competition**		**G-Index**		**E-Index**		**Analyst Coverage**	
	Low	**High**	**High**	**Low**	**High**	**Low**	**Low**	**High**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Pct. Options Accelerated	-0.460**	-0.135	-0.455*	-0.143	-0.383	-0.178	-0.334*	-0.146
	(-2.56)	(-1.02)	(-1.89)	(-0.92)	(-1.55)	(-1.10)	(-1.82)	(-0.80)
Log(Assets) [t-1]	-0.001	0.004	-0.006	-0.000	0.000	-0.003	0.006	-0.000
	(-0.36)	(1.59)	(-0.58)	(-0.03)	(0.00)	(-0.49)	(1.31)	(-0.11)
Log(Assets Squared) [t-1]	-0.000	-0.000*	0.000	-0.000	-0.000	-0.000	-0.001*	-0.000
	(-0.59)	(-1.95)	(0.47)	(-0.61)	(-0.08)	(-0.15)	(-1.96)	(-0.74)
Book-Market Ratio [t-1]	-0.027***	-0.016***	-0.022*	-0.025***	-0.030**	-0.021***	-0.026***	-0.024***
	(-4.44)	(-3.82)	(-1.90)	(-2.94)	(-2.08)	(-2.60)	(-3.72)	(-3.04)
Log(Stock Return) [t-1]	-0.004	0.000	-0.009	-0.006	-0.015	-0.004	-0.007*	-0.001
	(-0.97)	(0.08)	(-1.40)	(-1.18)	(-1.49)	(-0.88)	(-1.73)	(-0.12)
Log(Stock Return) [t-2]	0.005**	0.005***	0.006	0.001	0.003	0.003	0.001	0.006**
	(2.01)	(3.08)	(1.58)	(0.36)	(0.48)	(0.91)	(0.49)	(2.18)
Cash Flow/Assets [t-1]	0.049***	0.026***	0.077***	0.083***	0.087***	0.078***	0.033***	0.067***
	(4.23)	(5.35)	(4.23)	(4.42)	(3.84)	(4.64)	(4.54)	(4.24)
Debt/Assets [t-1]	-0.007	0.001	-0.004	-0.007	-0.004	-0.009	-0.003	0.001
	(-1.04)	(0.30)	(-0.32)	(-0.93)	(-0.29)	(-1.35)	(-0.40)	(0.15)
Accounting Loss [t-1]	-0.001	-0.005**	-0.002	-0.006	-0.000	-0.005	-0.005	0.000
	(-0.20)	(-2.29)	(-0.45)	(-1.59)	(-0.08)	(-1.55)	(-1.52)	(0.11)
Year Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Diff. Low vs. High Significant? (*p*-value)	0.001		0.165		0.859		0.022	
Obs.	3033	2880	1039	1235	824	1450	1768	1867
F-Statistic	30.63	10.68	8.92	13.61	6.72	18.85	11.9	7.42
# Accelerating Firms	198	272	80	100	91	89	139	164

Table 7: Option Acceleration: Effects on Advertisement and R&D Expenses

This table examines whether firms that accelerated option vesting spent less on advertisement and R&D expenditures. The dependent variable in Column (1) is *Ind.-adj. Adv./Assets*, which is advertisement expenditures over total assets, minus its mean value in the same industry and year. The dependent variable in Column (2) is *Ind.-adj. R&D/Assets*, which is R&D expenditures over total assets, minus its mean value in the same industry and year. The dependent variables in Columns (3) and (4) combine *Ind.-adj. Capex/Assets* with *Ind.-adj. Adv./Assets* or *Ind.-adj. R&D/Assets*. *Pct. Options Accelerated* is the number of options accelerated divided by total options outstanding. It is set equal to 0 for firms that do not accelerate. The 2SLS regressions instrument *Pct. Options Accelerated* using *Late Fiscal Year End*. In calendar year 2005, *Late Fiscal Year End* equals 1 for firms with fiscal year ending June or later, and 0 for firms with fiscal year ending May or earlier. In calendar year 2004, it equals 0 for all firms. *F-Statistic* is the Kleibergen-Paap [2006] *F*-Statistic of our instrument from the corresponding first-stage regression (not reported). The sample contains firms that trade on the New York Stock Exchange or NASDAQ. The sample excludes firms that voluntarily expensed the fair value of options prior to FAS 123-R, that changed fiscal year between 2002 and 2006, or that restricted employees from selling the underlying shares from accelerated options until after the original vesting date. All regressions include calendar year fixed effects. Control variables are calculated at fiscal year ends. Definitions of all variables are reported in Appendix A-1. We report *t*-statistics in parentheses, which are based on White heteroskedasticity-consistent standard errors. ***, **, * indicate significance levels of 1%, 5%, 10%, respectively.

Dependent Variable:	**Ind.-adj. Adv./Assets**	**Ind.-adj. R&D/Assets**	**Ind.-adj. (Capex/Assets + Adv./Assets)**	**Ind.-adj. (Capex/Assets + R&D/Assets)**
Model:	**2SLS**			
Sample:	**Calendar Years 2004-2005**			
	(1)	(2)	(3)	(4)
Pct. Options Accelerated	-0.344**	-0.505	-0.694***	-0.802**
	(-2.23)	(-1.62)	(-2.89)	(-2.17)
Log(Assets) [t-1]	0.001	-0.018***	0.005	-0.012
	(0.59)	(-2.68)	(1.06)	(-1.60)
Log(Assets Squared) [t-1]	-0.000	0.001**	-0.001*	0.000
	(-1.19)	(1.97)	(-1.75)	(0.81)
Book-Market Ratio [t-1]	-0.029***	-0.098***	-0.056***	-0.122***
	(-5.08)	(-9.48)	(-5.99)	(-10.69)
Log(Stock Return) [t-1]	-0.005*	-0.025***	-0.010**	-0.029***
	(-1.70)	(-4.30)	(-2.07)	(-4.42)
Log(Stock Return) [t-2]	0.004*	-0.013***	0.008**	-0.010**
	(1.71)	(-3.15)	(2.28)	(-2.06)
Cash Flow/Assets [t-1]	0.002	-0.172***	0.041***	-0.151***
	(0.31)	(-9.45)	(3.45)	(-7.69)
Debt/Assets [t-1]	-0.020***	-0.055***	-0.029***	-0.060***
	(-3.16)	(-4.48)	(-2.91)	(-4.44)
Accounting Loss [t-1]	-0.000	0.025***	-0.005	0.020***
	(-0.12)	(5.16)	(-1.03)	(3.64)
Year Fixed Effect	YES	YES	YES	YES
Obs.	2470	3509	2470	3509
F-Statistic	19.88	18.66	19.88	18.66

Table 8: Option Acceleration and Investment: Placebo Tests

This table provides placebo tests to analyze whether unobserved heterogeneity across our treatment and control group affected investment in years before FAS 123-R was adopted. The regressions test whether option acceleration in 2005 affected investment in 2002 or 2003. The dependent variable *Ind.-adj. Capex/Assets* is capital expenditures over total assets, minus its mean value in the same industry and year. The regressions in Column (1) and (2) use 2002 values of investment, while the regressions in Column (3) and (4) use 2003 values of investment. *Pct. Options Accelerated* is the number of options accelerated divided by total options outstanding. It is set equal to 0 for firms that do not accelerate. *Accelerate* is a dummy variable that equals 1 if a firm accelerated option vesting in 2005. The 2SLS regressions instrument *Pct. Options Accelerated* and *Accelerate* using *Late Fiscal Year End*. In calendar year 2005, *Late Fiscal Year End* equals 1 for firms with fiscal year ending June or later, and 0 for firms with fiscal year ending May or earlier. *F-Statistic* is the Kleibergen-Paap [2006] *F*-Statistic of our instrument from the corresponding first-stage regression (not reported). The sample contains firms that trade on the New York Stock Exchange or NASDAQ. We exclude firms that voluntarily expensed the fair value of options prior to FAS 123-R, that changed fiscal year between 2002 and 2006, or that restricted employees from selling the underlying shares from accelerated options until after the original vesting date. Definitions of all variables are reported in Appendix A-1. We report *t*-statistics in parentheses, which are based on White heteroskedasticity-consistent standard errors. ***, **, * indicate significance levels of 1%, 5%, 10%, respectively.

Dependent Variable:	**Ind.-adj. Capex/Assets**			
Model:	**2SLS**		**2SLS**	
Sample:	**Calendar Year 2002**		**Calendar Year 2003**	
	(1)	(2)	(3)	(4)
Pct. Options Accelerated [2005]	-0.050		0.020	
	(-0.47)		(0.25)	
Accelerate [2005]		0.011		0.017
		(0.35)		(0.72)
Log(Assets) [t-1]	-0.002	-0.001	0.004*	0.002
	(-0.69)	(-0.57)	(1.95)	(1.26)
Log(Assets Squared) [t-1]	-0.000	-0.000	-0.000**	-0.000*
	(-0.09)	(-0.08)	(-2.52)	(-1.68)
Book-Market Ratio [t-1]	-0.020***	-0.017***	-0.021***	-0.018***
	(-3.95)	(-3.35)	(-6.47)	(-5.52)
Log(Stock Return) [t-1]	0.005**	0.006***	0.000	0.001
	(2.49)	(3.08)	(0.24)	(0.79)
Log(Stock Return) [t-2]	0.008***	0.007***	0.001	0.001
	(4.48)	(4.48)	(0.75)	(0.85)
Cash Flow/Assets [t-1]	0.039***	0.040***	0.026***	0.025***
	(5.86)	(6.10)	(5.39)	(5.47)
Debt/Assets [t-1]	-0.010	-0.004	-0.011**	-0.009
	(-1.57)	(-0.64)	(-2.26)	(-1.62)
Accounting Loss [t-1]	-0.001	-0.000	-0.009***	-0.009***
	(-0.33)	(-0.18)	(-4.19)	(-4.17)
Year Fixed Effect	NO	NO	NO	NO
Obs.	2326	2586	2589	2849
F-Statistic	44.96	35.44	43.87	37.18

Table 9: Option Acceleration and Investment: Robustness Checks

This table provides robustness checks. The dependent variable in Columns (1) to (9) is *Ind.-adj. Capex/Assets*, which is capital expenditures over total assets, minus its mean value in the same industry and year. The dependent variable in Column (10) is capital expenditures over total assets. Definitions of variables are reported in Appendix A-1. Control variables are calculated at fiscal year ends. *F-Statistic* is the Kleibergen-Paap [2006] *F*-Statistic of our instrument from the corresponding first-stage regression. We report *t*-statistics in parentheses, which are based on White heteroskedasticity-consistent standard errors. ***, **, * indicate significance levels of 1%, 5%, 10%, respectively.

Dependent Variable:	**Ind.-adj. Capex/Assets**									**Capex/Assets**
Model:	**2SLS**									
Sample:	**Calendar Year 2005**	**Fiscal Year End March to August 2005**	**No Financials, Calendar Years 2004-2005**	**ExecuComp Firms, Calendar Years 2004-2005**	**Calendar Years 2004-2005**	**Calendar Years 2004-2005**	**Calendar Years 2004-2005**	**Calendar Years 2004-2005**	**PS Matched Sample, Calendar Years 2004-2005**	**Calendar Years 2004-2005**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Pct. Options Accelerated	-0.330**	-0.237*	-0.262**	-0.233*	-0.304***	-0.242*	-0.252*	-0.245*	-0.224*	-0.172*
	(-2.01)	(-1.86)	(-2.31)	(-1.69)	(-2.61)	(-1.89)	(-1.92)	(-1.88)	(-1.68)	(-1.79)
Log(Assets) [t-1]	0.004	0.004	0.003	0.001	0.002	0.003	-0.001	-0.002	0.005	0.001
	(1.10)	(1.06)	(1.10)	(0.17)	(1.03)	(1.10)	(-0.23)	(-0.40)	(0.85)	(0.55)
Log(Assets Squared) [t-1]	-0.000*	-0.000	-0.000**	-0.000	-0.000**	-0.000**	-0.000	-0.000	-0.001	-0.000
	(-1.67)	(-0.80)	(-2.19)	(-0.74)	(-2.00)	(-2.33)	(-0.34)	(-0.18)	(-1.34)	(-1.61)
Book-Market Ratio [t-1]	-0.031***	-0.000	-0.022***	-0.022***	-0.022***	-0.025***	-0.024***	-0.024***	-0.022*	-0.019***
	(-4.77)	(-0.07)	(-6.07)	(-3.70)	(-5.94)	(-5.20)	(-3.45)	(-3.43)	(-1.90)	(-6.03)
Log(Stock Return) [t-1]	-0.007	-0.004	-0.001	-0.001	-0.001	-0.004	-0.007*	-0.006	0.004	0.001
	(-1.04)	(-1.10)	(-0.61)	(-0.20)	(-0.65)	(-1.44)	(-1.69)	(-1.64)	(0.72)	(0.49)
Log(Stock Return) [t-2]	0.003	0.000	0.004***	0.008***	0.005***	0.003*	0.002	0.002	0.007	0.005***
	(1.26)	(0.12)	(2.83)	(3.03)	(3.23)	(1.79)	(0.92)	(0.95)	(1.31)	(3.35)
Cash Flow/Assets [t-1]	0.032***	0.021**	0.037***	0.074***	0.034***	0.043***	0.077***	0.077***	0.028**	0.040***
	(4.20)	(2.15)	(7.41)	(7.08)	(6.82)	(6.65)	(6.17)	(6.18)	(2.30)	(9.29)
Debt/Assets [t-1]	-0.010	0.004	-0.002	-0.006	-0.002	-0.001	-0.007	-0.007	0.001	0.002
	(-1.25)	(0.58)	(-0.39)	(-1.09)	(-0.59)	(-0.23)	(-1.13)	(-1.21)	(0.11)	(0.54)
Accounting Loss [t-1]	-0.003	-0.006	-0.004**	-0.003	-0.005***	-0.003	-0.005*	-0.004	-0.005	-0.004***
	(-1.14)	(-1.63)	(-2.23)	(-0.96)	(-2.74)	(-1.51)	(-1.66)	(-1.56)	(-0.86)	(-2.61)
Bonus Pay				-0.036***						
				(-4.37)						
Log(Total Incentives)				0.001*						
				(1.93)						
Low Competition					-0.006***					
					(-4.23)					
High Analyst Coverage						0.006***				
						(3.31)				
High G-Index							-0.004**			
							(-2.18)			
High E-Index								0.001		
								(0.36)		
Year Fixed Effects	N/A	N/A	YES	YES	YES	YES	YES	YES	YES	NO
Industry-Year Fixed Effects	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
Obs.	3082	967	5160	2416	5913	3635	2274	2274	836	5954
F-Statistic	15.20	15.34	32.73	17.09	35.43	19.17	22.32	22.44	8.82	37.77
# Accelerating Firms	440	59	386	194	470	303	180	180	470	472

Appendix A-1: Variable Definitions

Variable	Definition	Source
1. Measures of Option Acceleration and FAS 123-R Compliance		
Accelerate	Dummy variable that equals 1 in the calendar year in which a firm accelerated option vesting, and 0 otherwise.	R.G. Associates Option Acceleration Data
Pct. Options Accelerated	Number of options accelerated divided by the number of (vested and unvested) options outstanding. This variable is set equal to 0 for firms that do not accelerate option vesting. The number of options accelerated is from the R.G. Associates Option Accelerated Vester Database. The number of options outstanding is Compustat data item OPTOSBY.	R.G. Associates Option Acceleration Data
Accelerating Firm	Dummy variable which equals 1 in all sample years for firms that accelerated option vesting in calendar year 2005, and 0 in all sample years for firms that did not accelerate option vesting in 2005.	R.G. Associates Option Acceleration Data
Late Fiscal Year End	Dummy variable that equals 1 in the calendar year for which FAS 123-R takes effect for each firm, and 0 otherwise. In calendar year 2005, this variable equals 1 for firms with fiscal year endings between June and December, and 0 for firms with fiscal year endings between January and May. In calendar year 2004, this variable equals 0 for all firms. We identify fiscal year endings of firms using Compustat data item FYR.	Compustat
2. Investment Measures		
Ind.-adj. Capex/Assets	Industry-adjusted capital expenditures over total assets at the end of the fiscal year. We construct the variable by subtracting in each firm-fiscal-year the mean ratio of capital expenditures over total assets of firms in the same industry in the same fiscal year. We use the Fama-French 12-industries classification to identify industries. Capital expenditures is Compustat data item CAPX. This variable is winsorized at the 1-99% level.	Compustat
Ind.-adj. Adv./Assets	Industry-adjusted advertisement expenditures over total assets at the end of the fiscal year. We construct the variable by subtracting in each firm-fiscal-year the mean ratio of advertisement expenditures over total assets of firms in the same industry in the same fiscal year. We use the Fama-French 12-industries classification to identify industries. Advertisement expenditures is Compustat data item XAD. This variable is winsorized at the 1-99% level.	Compustat
Ind.-adj. R&D/Assets	Industry-adjusted R&D expenditures over total assets at the end of the fiscal year. We construct the variable by subtracting in each firm-fiscal-year the mean ratio of R&D expenditures over total assets of firms in the same industry in the same fiscal year. We use the Fama-French 12-industries classification to identify industries. R&D expenditures is Compustat data item XRD. This variable is winsorized at the 1-99% level.	Compustat
3. Other Dependent Variables		
Log(Exercised Option Value)	The natural logarithm of 1 plus the dollar value of stock options exercised by a CEO during the calendar year. Option value is (Exercise-date Stock Price – Strike Price)*(Number Options Exercised). Exercise date Stock Price is the closing value of the firm's daily stock price from CRSP. Strike Price is Thomson Insiders data item XPRICE, and Number Options Exercised is Thomson Insiders data item NUM_DERIV.	Thomson Insiders, CRSP
Early Option Exercise	Dummy variable which equals one 1 if in a given calendar year a CEO exercises at least one option with seven to nine years until expiration (six to eight years in 2007 only), and 0 otherwise. This variable is based on the fact that most options accelerated in 2005 had at the time eight to ten years until expiration. Years until expiration is the difference between the option's exercise date and its expiration date (Thomson Insiders data item TDATE).	Thomson Insiders
Log(Sold Shares Value)	The natural logarithm of 1 plus the dollar value of shares sold following option exercise by a CEO during the calendar year. Share value is the sale-date stock price (Thomson Insiders data item TPRICE) multiplied by number of shares sold (Thomson Insiders data item HARES). This dollar value is calculated only for shares sold following option exercise. If the CEO sells more shares than obtained	Thomson Insiders

	from option exercise, the dollar value from the additional shares sold is excluded from the total.	
Pct. Change in Unvested Option Value	Annual percentage change, from calendar year t-1 to calendar year t, in the dollar value of an executive's unvested stock options. It is constructed using ExecuComp data item OPT_UNEX_UNEXER_EST_VAL. The dollar value is as of fiscal year end. The variable is winsorized at the 5-95% level.	ExecuComp
Pct. Change in Unvested Equity Value	Annual percentage change, from calendar year t-1 to calendar year t, in the dollar value of an executive's unvested stock options and restricted stock. It is constructed using ExecuComp data item OPT_UNEX_UNEXER_EST_VAL plus ExecuComp data item STOCK_UNVEST_VAL. The dollar value is as of fiscal year end. This variable is winsorized at the 5-95% level.	ExecuComp
Pct. Change in Unvested Option Incentives	Annual percentage change, from calendar year t-1 to calendar year t, in the pay-for performance sensitivity (PPS) from an executive's unvested stock options for a 1% change in the stock price. PPS is constructed as follows: (Number of Unvested Stock Options)*(Black-Scholes Option Delta)*(Year-End Stock Price)*(1/100). Number of Unvested Stock Options is ExecuComp data item OPT_UNEX_UNEXER_EST_VAL. Black-Scholes Option Delta is defined using the procedure developed by Core and Guay [2002]. This variable is winsorized at the 5-95% level.	ExecuComp
Pct. Change in Unvested Equity Incentives	Annual percentage change, from calendar year t-1 to calendar year t, in the pay-for-performance sensitivity (PPS) from an executive's unvested stock options and restricted stock for a 1% change in the stock price. PPS is constructed as follows: (Number of Unvested Stock Options)*(Black-Scholes Option Delta)*(Year-End Stock Price)*(1/100) + (Shares of Unvested Stock)*(Year-End Stock Price)*(1/100). Number of Unvested Stock Options is ExecuComp data item OPT_UNEX_UNEXER_EST_VAL. Black-Scholes Delta is defined using the Core and Guay [2002] procedure. We use ExecuComp data item STOCK_UNVEST_VAL to measure (Shares of Unvested Stock)*(Year-End Stock Price). This variable is winsorized at the 5-95% level.	ExecuComp
Pct. Change in Value of Newly Granted Equity	Annual percentage change, from calendar year t-1 to calendar year t, in dollar value of newly granted stock and options. Newly granted options are ExecuComp data item OPTION_AWARDS_BLK_VALUE before 2006, and OPTION_AWARDS_FV after 2006. Newly granted stock is ExecuComp data item RSKTGRNT before 2006, and STOCK_AWARDS_FV after 2006. This variable is winsorized at the 5-95% level.	ExecuComp
Vesting Duration of Newly Granted Stock Options	The vesting duration of newly granted stock options. Duration is calculated for each option grant by multiplying the number of years until part of the grant vests by the fraction of the grant's options that vest on that date, and then summing these numbers for all of the grant's vesting dates. Duration is capped from above at 10. For executives with new multiple option grants, this variable is the weighted average of each individual grant's duration. Options' vesting dates are based on Thomson Insiders data item XDATE.	Thomson Insiders
4. Control Variables		
Log(Assets)	The natural logarithm of the value of a firm's total assets in million USD at the end of the fiscal year. Total assets is Compustat data item AT.	Compustat
Book-Market Ratio	Book value of shareholder equity (Compustat data item SEQ) divided by the sum of market capitalization and book value of liabilities (data item LT) at the end of the fiscal year. Market capitalization is data item PRCC multiplied by data item CSHO. This variable is winsorized at the 1-99% level.	Compustat
Log(Stock Return)	The natural logarithm of 1 plus the fractional stock return. The return is measures as stock price at the end of the fiscal year plus dividends minus stock price at the end of the previous fiscal year, and divided by the stock price at the end of the previous fiscal year. This variable is winsorized at the 5-95% level.	Compustat
Cash Flow/Assets	Cash flows over total assets at the end of the fiscal year. Cash flows are the sum of cash flows from operations (Compustat data item OANCF), cash flows from investing activities (IVNCF), capital expenditures (CAPX), acquisitions (AQC) minus dividends on common and preferred stock (CDVC and PDVC). This variable is winsorized at the 1-99% level.	Compustat

Debt/Assets	Total debt over total assets at the end of the fiscal year. Total debt is Compustat data item DLTT (long-term debt) plus Compustat data item DLC (debt in current liabilities). Total assets is Compustat data item AT. This variable is winsorized at the 1-99% level.	Compustat
Accounting Loss	Dummy variable that equals 1 if net income is negative at the end of the fiscal year, and 0 otherwise. Net income is Compustat data item NI.	Compustat
Negative Interest Coverage	Dummy variable which equals 1 if earnings before interest and taxes (Compustat data item EBIT) are smaller than the interest expenses (Compustat data item XINT) at the end of the fiscal year, and 0 otherwise.	Compustat
After 2005	Dummy variable which equals 1 for calendar years 2006 and 2007, and 0 for calendar years 2004 and 2005.	
After 2002	Dummy variable which equals 1 for calendar years 2003 and 2004, and 0 for calendar years 2001 and 2002.	
CEO Tenure	Dummy variable which equals 1 if a CEO is in his/her first four years of tenure at the firm, and 0 otherwise. We count the CEO's first year on the job as the first time they appear in Thomson Insiders with data item ROLECODE equal to CEO.	Thomson Insiders
Log(Annual Equity Pay)	The natural logarithm of 1 plus the dollar value of annual new equity pay. Equity pay is the sum of ExecuComp data items OPTION_AWARDS_BLK_VALUE and RSTKGRNT before 2006, and data items OPTION_AWARDS_FV and STOCK_AWARDS_FV after 2006.	ExecuComp
Bonus Pay	Annual bonus compensation divided by the sum of annual bonus and salary compensation. Bonus compensation is ExecuComp data item BONUS. Salary compensation is ExecuComp data item SALARY. For each firm, this variable is averaged across top executives listed in ExecuComp. This variable is winsorized at the 1-99% level.	ExecuComp
Log(Total Incentives)	The natural logarithm of 1 plus the pay-for-performance sensitivity (PPS) from an executive's total holdings of firm equity. PPS is the change in dollar value of equity for a 1% change in the stock price. PPS is constructed as follows: (Unexercisable Stock Options)*(Black-Scholes Option Delta)*(Year-End Stock Price)*(1/100) + (Exercisable Stock Options)*(Black-Scholes Option Delta)*(Year-End Stock Price)*(1/100) + (Total Stock Owned)*(Year-End Stock Price)*(1/100). Number of Unexercisable Stock Options is ExecuComp data item OPT UNEX UNEXER NUM. Number of Exercisable Stock Options is data item OPT UNEX EXER NUM. Total Stock Owned is data item SHROWN EXCL OPTS. Black-Scholes Delta is defined using the Core and Guay [2002] procedure. For each firm, this variable is averaged across top executives listed in ExecuComp.	ExecuComp
Low Competition	Dummy variable which equals 1 for firms that operate in industries with low competition in a given year, and 0 otherwise. Competition is measured using the Herfindahl index. The Herfindahl index is measured using sales. Industries are classified using 3-digit SIC codes, following the procedure in Giroud and Mueller [2011]. Low competition industries are industries where the index takes values above the sample median.	Compustat
High G-Index	Dummy variable that equals 1 for firms where the G-Index is above the sample median in a given year, and 0 otherwise. The G-Index is the anti-takeover index constructed by Gompers, Ishii, and Metrick [2003]. Higher index values indicate more anti-takeover provisions.	Gompers, Ishii, and Metrick [2003], RiskMetrics
High E-Index	Dummy variable that equals 1 for firms where the E-Index is above the sample median in a given year, and 0 otherwise. The E-Index is the anti-takeover index constructed by Bebchuk, Cohen, and Ferrell [2009]. Higher index values indicate more anti-takeover provisions.	Bebchuk, Cohen, and Ferrell [2009], RiskMetrics
High Analyst Coverage	Dummy variable which equals 1 for firms where the number of analysts that cover the firm is above the sample median in a given year, and 0 otherwise.	IBES

Appendix A-2: Timeline of Events around Adoption of FAS 123-R

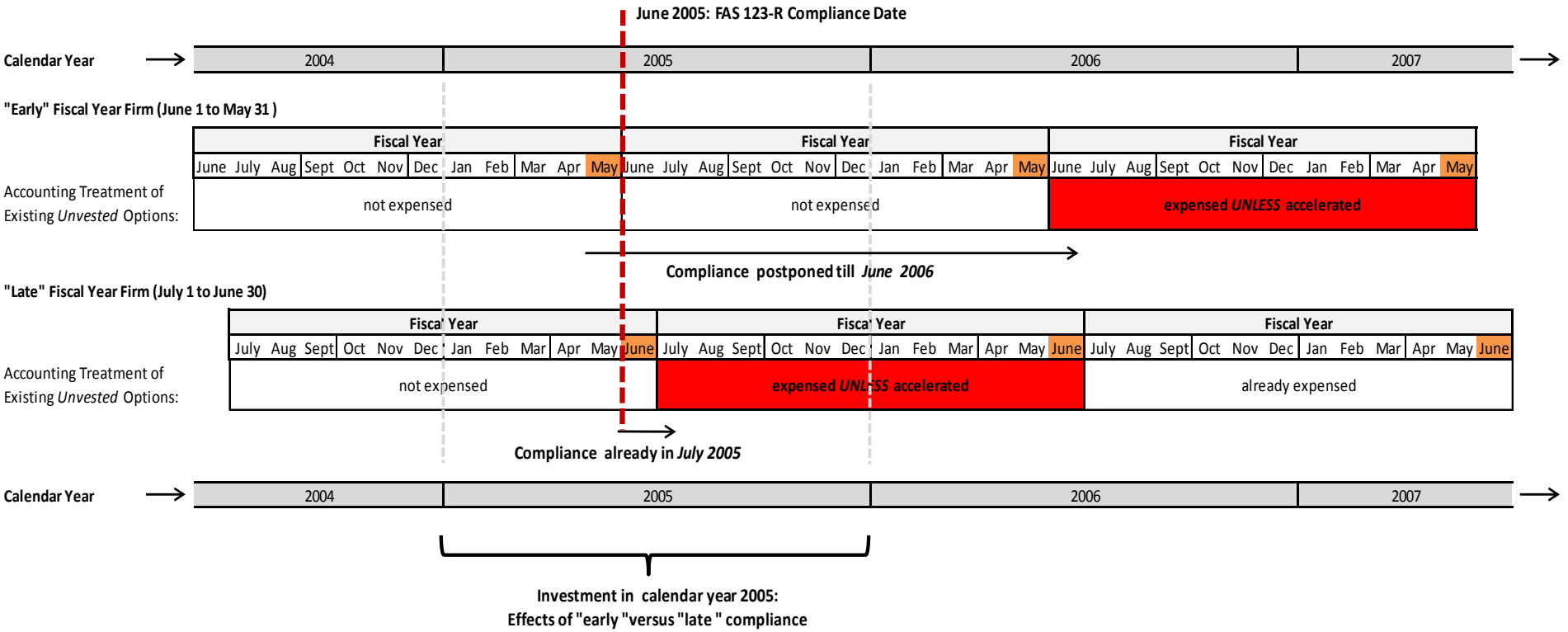
This appendix provides an overview of the events around the adoption of FAS123-R.

Date	Event
October 1972	Accounting Principles Board (APB) issues Opinion 25, which defines the accounting expense for stock options as the difference between the strike price and the grant-date market price.
May 1984	Financial Accounting Standards Board (FASB) considers revising stock option accounting and invites comments on the issue.
1986	FASB tables a proposal that would have required stock options to be expensed according to their grant-date fair value (determined by the Black-Scholes formula or similar option pricing model).
April 1992	FASB unanimously votes to endorse changing accounting treatment of stock options, and begins holding numerous meetings with practitioners as it devises a formal proposal.
June 30, 1993	FASB issues an Exposure Draft that requires options to be expensed at fair value.
March 25, 1994	More than 4,000 employees of Silicon Valley firms rally in opposition to FASB's proposal. Soon afterward, U.S. Senate passes a resolution urging FASB to abandon the fair-value proposal.
December 14, 1994	FASB votes to abandon the fair-value proposal.
October 1995	FASB adopts FAS 123, which encourages firms to expense options using the fair-value method, but also allows firms to continue using APB Opinion 25 so long as they disclose the option fair value in a footnote.
July - August 2002	96 firms announce the decision to voluntarily begin accounting for options using the fair-value method.
March 2003	FASB adds to its agenda the reconsideration of accounting treatment for options.
March 31, 2004	FASB issues an Exposure Draft that requires firms to adopt fair-value accounting for options in the first fiscal year starting after December 15, 2004.
August 2004	FASB begins to hold a series of 21 public meetings on option accounting.
October 6, 2004	FASB votes that firms do not have to expense accelerated options unless they are in the money.
December 6, 2004	SEC clarifies that firms must publicly disclose option acceleration.
December 16, 2004	FASB issues FAS 123-R, which requires all firms to begin accounting for stock options using the fair-value method beginning in the third quarter of 2005.
April 14, 2005	SEC postpones the effective date of FAS 123-R to the first quarter of the first full fiscal year starting after June 15, 2005. Small business issuers and non-public entities must adopt FAS 123-R in first fiscal year starting after December 15, 2005.

Sources: FAS 123-R, Murphy [2013], Aboody, Barth, and Kasznik [2004].

Appendix A-3: Illustration of the Compliance Rule of FAS 123-R

This appendix provides an illustration of the compliance rule of FAS 123-R. We compare how FAS 123-R affected firms with fiscal year ending in either May or June.



Appendix A-4: Example of Option Acceleration Release

This appendix provides an excerpt of a 8-K material event filing by Sun Microsystems, Inc., which accelerated the vesting of stock options in calendar year 2005 in response to FAS 123-R . The form was filed with the SEC on April 28, 2005. Emphasis is ours.

Item 1.01. Entry into a Material Definitive Agreement.

On April 28, 2005, Sun Microsystems, Inc. (the "Company") approved the acceleration of vesting of certain unvested and "out-of-the-money" stock options with exercise prices equal to or greater than $6.00 per share previously awarded to its employees, including its executive officers, and its directors under the Company's equity compensation plans. **The acceleration of vesting will be effective for stock options outstanding as of May 30, 2005**. Options to purchase approximately 45.2 million shares of common stock or 18% of the Company's outstanding unvested options (of which options to purchase approximately 2.75 million shares or 1% of the Company's outstanding unvested options are held by the Company's executive officers) are subject to the acceleration. […]

The **purpose of the acceleration** is to enable the Company to **avoid recognizing compensation expense** associated with these options in future periods in its consolidated statements of operations, upon adoption of FASB Statement No. 123R (Share-Based Payment) in July 2005. The **pre-tax charge to be avoided amounts to approximately $400 million** over the course of the original vesting periods, which on average is approximately 1.5 years from the effective date of the acceleration. […]

Appendix A-5: Correlations

This appendix provides pairwise correlations of the main variables used in the analysis. The sample contains firms that trade on the New York Stock Exchange or NASDAQ. We exclude firms that voluntarily expensed the fair value of options prior to FAS 123-R, that changed fiscal year between 2002 and 2006, or that restricted employees from selling the underlying shares from accelerated options until after the original vesting date. Correlations are reported for calendar year 2005. * indicates significance at the 1% level.

	Ind.-adj. Capex/Assets	Pct. Options Accelerated	Log(Assets)	Book-Market Ratio	Log(Stock Return)	Cash Flow/Assets	Debt /Assets	Accounting Loss
Ind.-adj. Capex/Assets	1							
Pct. Options Accelerated	-0.0085	1						
Log(Assets)	-0.0618*	-0.0191	1					
Book-Market Ratio	-0.0520*	0.0552*	-0.2192*	1				
Log(Stock Return)	0.0369	-0.1752*	0.1333*	-0.2321*	1			
Cash Flow/Assets	0.0853*	-0.0177	0.2598*	0.0961*	0.1931*	1		
Debt/Assets	0.0719*	-0.033	0.2185*	-0.3174*	0.0073	-0.0571*	1	
Accounting Loss	0.0014	0.0652*	-0.3623*	0.0975*	-0.3268*	-0.3708*	0.0584*	1

Appendix A-6: Executive Incentive Horizons and Option Acceleration

This appendix provides regressions to estimate the effect of option acceleration on different measures of executive incentive horizon. The regressions are estimated in 2005, using firms that are in our sample and in ExecuComp. All regressions are at the executive-firm level, and include all of these firms' top executives who are listed in ExecuComp. The dependent variable in Columns (1) and (2) is the year-on-year percentage change in the dollar value of unvested stock options. The dependent variable in Columns (3) and (4) is the year-on-year percentage change in the dollar value of total unvested equity, which consists of stock options and restricted stock. The dependent variable in Columns (5) and (6) is the year-on-year percentage change in the pay-for-performance sensitivity (PPS) of unvested stock options. The dependent variable in Columns (7) and (8) is the year-on-year percentage change in the PPS of total unvested equity. PPS is defined as the dollar change in equity value for a 1% change in the stock price. *Accelerate* is a dummy variable that equals 1 in the calendar year in which a firm accelerated option vesting, and 0 otherwise. All regressions include industry fixed effects based on the Fama-French 12-industry classification. Control variables are calculated at fiscal year ends. Variable definitions are reported in Appendix A-1. We report *t*-statistics in parentheses, which are based on White heteroskedasticity-consistent standard errors and clustered at the firm level. ***, **, * indicate significance levels of 1%, 5%, 10%, respectively.

Dependent Variable:	**Pct. Change in Unvested Option Value**		**Pct. Change in Unvested Equity Value**		**Pct. Change in Unvested Option Incentives**		**Pct. Change in Unvested Equity Incentives**	
Model:	**OLS**		**OLS**		**OLS**		**OLS**	
Sample:	**ExecuComp Firms, Calendar Year 2005**							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Accelerate	-0.609***	-0.757***	-0.445***	-0.578***	-0.431***	-0.449***	-0.404***	-0.441***
	(-7.24)	(-8.85)	(-4.54)	(-5.99)	(-9.19)	(-9.36)	(-4.32)	(-5.15)
Log(Assets) [t-1]		-0.259		-0.211		-0.022		-0.049
		(-1.39)		(-1.14)		(-0.26)		(-0.31)
Log(Assets Squared) [t-1]		0.011		0.009		0.000		0.001
		(0.97)		(0.79)		(0.09)		(0.09)
Book-Market Ratio [t-1]		-1.165***		-0.909***		-0.433***		-0.748***
		(-4.90)		(-3.56)		(-3.47)		(-3.37)
Log(Stock Return) [t-1]		-1.112***		-1.084***		-0.270***		-0.403***
		(-7.70)		(-7.34)		(-4.20)		(-2.92)
Log(Stock Return) [t-2]		-0.593***		-0.501***		-0.119***		-0.200**
		(-5.27)		(-4.34)		(-2.60)		(-2.03)
Cash Flow/Assets [t-1]		0.396		0.491		0.035		0.142
		(1.29)		(1.58)		(0.22)		(0.51)
Debt/Assets [t-1]		-0.628***		-0.456**		-0.259**		-0.247
		(-2.96)		(-2.16)		(-2.42)		(-1.33)
Accounting Loss [t-1]		0.135		0.100		0.068		0.323**
		(1.05)		(0.77)		(1.18)		(2.21)
Industry Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	5735	5349	5735	5349	5892	5559	5551	5242
Adj. R-sq.	0.042	0.112	0.021	0.076	0.054	0.070	0.017	0.037

Appendix A-7: New Equity Grants Following Option Acceleration

This appendix provides regressions to estimate whether accelerating firms granted more new equity grants after FAS 123-R, to replenish top executives' incentive horizons. The regressions are estimated for 2005 and 2006, using firms that are in our sample and in ExecuComp. All regressions are at the executive-firm level, and include all of these firms' top executives who are listed in ExecuComp. The dependent variable in Columns (1) and (2) is *Pct. Change in Value of Newly Granted Equity*, the year-on-year percentage change in the dollar value of newly granted stock and options. The dependent variable in Columns (3) and (4) is *Vesting Duration of Newly Granted Stock Options*, the vesting duration of newly granted stock options. Duration is the number of years until part of an option grant vests multiplied by the fraction of the grant's options that vest on that date, summed over all vesting dates for the grant. For executives with multiple new option grants, *Vesting Duration of Newly Granted Stock Options* is the weighted average of the individual grants' durations. *Accelerating Firm* equals 1 if a firm accelerated option vesting in 2005, and 0 otherwise. All regressions include industry fixed effects based on the Fama-French 12-industry classification. Control variables are calculated at fiscal year ends. Variable definitions are reported in Appendix A-1. We report *t*-statistics in parentheses, which are based on White heteroskedasticity-consistent standard errors and clustered at the firm level. ***, **, * indicate significance levels of 1%, 5%, 10%, respectively.

Dependent Variable:	**Pct. Change in Value of Newly Granted Equity**		**Vesting Duration of Newly Granted Stock Options**	
Model:	**OLS**		**OLS**	
Sample:	**ExecuComp Firms, Calendar Year 2005**	**ExecuComp Firms, Calendar Year 2006**	**ExecuComp Firms, Calendar Year 2005**	**ExecuComp Firms, Calendar Year 2006**
	(1)	(2)	(3)	(4)
Accelerating Firm	-0.168***	-0.009	-0.059	-0.022
	(-2.81)	(-0.12)	(-0.62)	(-0.25)
Log(Assets) [t-1]	0.195**	-0.180	0.192	0.008
	(2.03)	(-1.53)	(1.23)	(0.05)
Log(Assets Squared) [t-1]	-0.013**	0.014*	-0.006	0.003
	(-2.14)	(1.88)	(-0.61)	(0.26)
Book-Market Ratio [t-1]	0.254*	0.057	-0.302	-0.783***
	(1.78)	(0.38)	(-1.45)	(-3.55)
Log(Stock Return) [t-1]	0.247***	0.287***	0.006	-0.298***
	(3.33)	(3.35)	(0.06)	(-2.81)
Log(Stock Return) [t-2]	0.057	-0.068	-0.083	-0.246***
	(1.00)	(-0.88)	(-0.82)	(-2.95)
Cash Flow/Assets [t-1]	-0.265	-0.290	-0.094	0.365
	(-1.40)	(-1.32)	(-0.30)	(1.17)
Debt/Assets [t-1]	0.099	0.160	-0.143	-0.299
	(0.73)	(0.99)	(-0.59)	(-1.20)
Accounting Loss [t-1]	-0.160**	0.060	0.033	0.004
	(-2.40)	(0.67)	(0.34)	(0.03)
Log(Total Incentives) [t-1]	0.021	0.010	0.146***	0.143***
	(1.55)	(0.61)	(6.61)	(6.30)
Industry Fixed Effects	YES	YES	YES	YES
Obs.	5274	4945	6056	5841
Adj. R-sq.	0.033	0.095	0.025	0.106

Appendix A-8: Reduced Form Regressions

This appendix provides reduced form regressions for our instrument *Late Fiscal Year End*. *Late Fiscal Year End* equals 1 for firms with fiscal year ending June or later, and 0 for firms with fiscal year ending May or earlier. In calendar year 2004, it equals zero for all firms. The dependent variable *Ind.-adj. Capex/Assets* is capital expenditures over total assets, minus its mean value in the same industry and year. Definitions of all control variables are reported in Appendix A-1. Control variables are calculated at fiscal year ends. All regressions include calendar year fixed effects. We report *t*-statistics in parentheses, which are based on White heteroskedasticity-consistent standard errors. ***, **, * indicate significance levels of 1%, 5%, 10%, respectively.

Dependent Variable:	**Ind.-adj. Capex/Assets**	
Mode:	**OLS**	
Sample:	**Calendar Years 2004-2005**	
	(1)	(2)
Late Fiscal Year End	-0.003**	-0.006***
	(-2.32)	(-4.01)
Log(Assets) [t-1]		-0.001
		(-0.29)
Log(Assets Squared) [t-1]		-0.000
		(-0.82)
Book-Market Ratio [t-1]		-0.020***
		(-7.19)
Log(Stock Return) [t-1]		0.003**
		(2.00)
Log(Stock Return) [t-2]		0.004***
		(3.33)
Cash Flow/Assets [t-1]		0.037***
		(9.77)
Debt/Assets [t-1]		0.002
		(0.81)
Accounting Loss [t-1]		-0.005***
		(-3.33)
Constant	0.002	0.013**
	(1.14)	(2.10)
Year Fixed Effects	YES	YES
Obs.	7864	5954
Adj. R-sq.	0.000	0.042

Appendix A-9: Placebo Tests: Advertisement and R&D Expenses

This appendix provides placebo tests to analyze whether the acceleration of option vesting in 2005 affects investment in the year before FAS 123-R was adopted. The dependent variable *Ind.-adj. Adv./Assets* is advertisement expenditures over total assets, minus its mean value in the same industry and year. The dependent variable *Ind.-adj. R&D/Assets* is R&D expenditures over total assets, minus its mean value in the same industry and year. The dependent variables in Columns (5) to (8) combine *Ind.-adj. Capex/Assets* with *Ind.-adj. Adv./Assets* or *Ind.-adj. R&D/Assets*. The regressions use 2003 values of investment. *Pct. Options Accelerated* is the number of options accelerated in 2005 divided by total options outstanding. It is set equal to 0 for firms that do not accelerate. Accelerate is a dummy variable that equals 1 if a firm accelerated option vesting in 2005. The 2SLS regressions instrument *Pct. Options Accelerated* and *Accelerate* using *Late Fiscal Year End*, which equals 1 for firms with fiscal year ending June or later, and 0 for firms with fiscal year ending May or earlier. *F-Statistic* is the Kleibergen-Paap [2006] *F*-Statistic of our instrument from the corresponding first-stage regression (not reported). All regressions include calendar year fixed effects. Control variables are calculated at fiscal year ends. Definitions of all control variables are reported in Appendix A-1. We report *t*-statistics in parentheses, which are based on White heteroskedasticity-consistent standard errors. ***, **, * indicate significance levels of 1%, 5%, 10%, respectively.

Dependent Variable:	**Ind.-adj. Adv./Assets**		**Ind.-adj. R&D/Assets**		**Ind.-adj. (Capex/Assets + Adv./Assets)**		**Ind.-adj. (Capex/Assets + R&D/Assets)**	
Model:	**2SLS**		**2SLS**		**2SLS**		**2SLS**	
Sample:	**Calendar Year 2003**							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Pct. Options Accelerated [2005]	-0.046		-0.303		-0.033		-0.373	
	(-0.37)		(-1.29)		(-0.22)		(-1.43)	
Accelerate [2005]		-0.029		-0.080		-0.021		-0.092
		(-0.80)		(-1.22)		(-0.48)		(-1.28)
Log(Assets) [t-1]	-0.005	-0.003	-0.005	0.001	0.001	-0.001	-0.001	0.005
	(-1.22)	(-0.74)	(-0.66)	(0.08)	(0.11)	(-0.13)	(-0.09)	(0.59)
Log(Assets Squared) [t-1]	0.000	0.000	-0.000	-0.000	-0.000	-0.000	-0.001	-0.001
	(0.65)	(0.10)	(-0.17)	(-0.82)	(-0.68)	(-0.34)	(-0.90)	(-1.38)
Book-Market Ratio [t-1]	-0.027***	-0.028***	-0.056***	-0.052***	-0.053***	-0.051***	-0.077***	-0.072***
	(-4.16)	(-3.86)	(-5.52)	(-4.93)	(-5.50)	(-5.07)	(-6.95)	(-6.22)
Log(Stock Return) [t-1]	0.002	0.002	-0.018***	-0.017***	0.001	0.003	-0.018***	-0.016***
	(0.64)	(0.83)	(-3.23)	(-3.33)	(0.38)	(0.95)	(-2.95)	(-2.93)
Log(Stock Return) [t-2]	0.004	0.003	-0.011**	-0.011**	0.008*	0.007*	-0.010*	-0.010**
	(1.25)	(1.05)	(-2.42)	(-2.55)	(1.92)	(1.79)	(-1.86)	(-2.02)
Cash Flow/Assets [t-1]	0.010	0.010	-0.125***	-0.129***	0.039***	0.036***	-0.105***	-0.111***
	(0.89)	(1.08)	(-6.68)	(-7.08)	(2.77)	(3.03)	(-5.34)	(-5.78)
Debt/Assets [t-1]	-0.028***	-0.032***	-0.067***	-0.063***	-0.043***	-0.048***	-0.083***	-0.078***
	(-2.63)	(-2.91)	(-4.23)	(-3.67)	(-3.20)	(-3.48)	(-4.74)	(-4.13)
Accounting Loss [t-1]	0.005	0.007*	0.028***	0.024***	-0.002	0.000	0.023***	0.020***
	(1.11)	(1.72)	(3.89)	(3.71)	(-0.40)	(0.08)	(2.97)	(2.73)
Year Fixed Effect	NO	NO	NO	NO	NO	NO	NO	NO
Obs.	895	986	1607	1732	893	984	1605	1730
F-Statistic	16.82	18.96	29.28	22.94	16.56	18.60	28.97	22.63

Appendix A-10: Stock Returns Following Investment Cuts

This appendix presents cumulative monthly stock returns for different windows from January 2006 to December 2007, for firms that had to comply with FAS 123-R in calendar year 2005 and accelerated option vesting in that year. Accelerating firms are combined into a portfolio with monthly returns weighted by total assets. This appendix presents the holding period rate of return for normal stock returns (i.e., unadjusted for risk). The appendix also shows the cumulative abnormal stock return based on three different models: (i) CAPM; (ii) Fama-French 3-factor; and (iii) Carhart (1997) 4-factor including momentum. Estimation windows for these three models are (-48,-1) months before January 2006. Firms with fewer than 12 months of returns in the estimation window are omitted. The market return in these three models is the CRSP value-weighted market index. Monthly stock return data is also from CRSP. We report *t*-statistics in parentheses that are based on Crude Dependence Adjustment standard errors. ***, **, * indicate significance levels of 1%, 5%, 10%, respectively.

		Cumulative Stock Returns		
Model	**Normal Returns**	**CAPM**	**Fama-French 3-Factor**	**Carhart 4-Factor**
Jan. – May 2006	7.74%	1.29% (-0.392)	1.00% (-.407)	0.69% (.434)
Jun. – Dec. 2006	7.57%	-6.95% (-1.48)*	-4.59% (-1.09)	-4.78% (-1.14)
Jan. – Dec. 2007	-4.82%	-17.91% (-2.70)***	-11.77% (-1.97)**	-9.49% (-1.6)*
Jan. 2006 – Dec. 2007	10.31%	-23.57% (-2.51)**	-15.36% (-1.82)**	-13.57% (-1.62)*