Does the Capital Market Punish Managerial Myopia?

Yixing (Jamie) Tong
University of Western Australia

Feida (Frank) Zhang*
Murdoch University

*Corresponding author: School of Management and Governance, Murdoch University, Murdoch, Perth, WA. Email: Frank.Zhang@murdoch.edu.au, Tel: 61-8-9360-2868. We thank seminar participants at Tsinghua University, Renmin University, Jinan University, Wuhan University, and Hong Kong Baptist University. The authors would like to acknowledge the generous financial support of the National Natural Science Foundation of China (approval number: 71002058, 71202090, 71202091).

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Abstract

The extant literature provides conflicting arguments on whether the capital market punishes managers' myopic behavior. Stein (1988, 1989) argues that the capital market is myopic and will push managers to behave myopically. In contrast, Jensen (1988) believes that the capital market is efficient and will punish managerial myopia. However, empirical studies on how the stock market reacts to managerial myopia are scarce. This study aims to fill in this gap by examining how the capital market reacts to managerial myopia. Using managers' cutting R&D to meet short-term earnings goals as a research setting, this study reveals that the capital market actually penalizes managerial myopia, especially for firms with high investor sophistication. Our results are consistent with Jensen's (1988) contention that the security market is not shortsighted. Additionally, we document that compensation, especially cash compensation, could be one of the reasons why managers behave myopically.

JEL classifications: G32; M41

Keywords: Managerial Myopia; Capital Market; Investor Sophistication; CEO Compensation.

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I. Introduction

Defined as managers' desire to achieve a high current stock price by inflating current earnings at the expense of long-term cash flows or earnings (Bhojraj & Libby, 2005; Stein, 1989), managerial myopia is believed to be a first-order problem faced by the modern firm (Edmans, 2009). Indeed, Graham, Harvey, and Rajgopal (2005) survey and interview more than 400 executives, and document that 78% of executives would forgo a project with positive net present value if the project would cause them to miss short-term earnings targets. Empirical studies of managerial myopic behavior have focused mainly on R&D expenditure and the evidence is consistent with managers myopically cutting investment in R&D to achieve various income objectives (Baber, Fairfield, & Haggard, 1991; Bange & De Bondt, 1998; Bens, Nagar, & Wong, 2002; Cooper & Selto, 1991; Dechow & Sloan, 1991; Jacobs, 1991; Roychowdhury, 2006).

The origins of managerial myopia have been debated, and central to the debate is the view that US equity markets force corporate managers to behave myopically (Jacobs 1991; Porter 1992). The view arises from the belief that investors cannot see beyond current earnings and will depress stock prices when there is any reduction in short-term earnings. Because R&D investments are expensed under current Generally Accepted Accounting Principles (GAAP), managers have incentives to avoid such investments in spite of the long-term payoffs. Essentially, managers underinvest in R&D to create the impression that the firm's current and future profitability is greater

than it actually is, hoping this will boost today's share price (Stein 1989). Hence, managers are pressured into trading long-term performance for short-term performance in order to meet stock market expectation, and especially in order to secure impatient capital.

Prominent CEOs have expressed their concerns about the pressure from the capital market. For example, Anne Mulcahy, former Chairperson and CEO of Xerox, stated that fixating on short-term performance is one of "the most dysfunctional things" in the marketplace, and it may hurt U.S. firms in the long run[1]. During Google's IPO offering in 2004, management of Google said it did not want to lose focus on its long-term goals and therefore declined to provide frequent earnings guidance (Gigler, Kanodia, Sapra, & Venugopalan, 2009). Such concerns are also shared by regulators. An independent commission established by the US chamber of Commerce recommends discontinuing quarterly earnings guidance and believes reducing the pressures to meet precise quarterly earnings target is an important first step in shifting the focus of the US capital markets away from quarterly results and toward the long-term performance of US companies (Cheng, Subramanyam, & Zhang, 2007).

If capital market does pressure managers to behave myopically, we would expect a negative stock price reaction to managers' myopic behaviors. However, prior empirical studies provide mixed results. Some scholars find that the stock market reacts positively to announcements of R&D increases (Jarrell & Lehn, 1985;

[1] Information source: http://knowledge.wharton.upenn.edu/index.cfm?fa=viewArticle&id=1318&specialId=41.

Woolridge, 1988) even when such announcements occur in the face of an earnings disappointment (Chan, J. Martin, & Kensinger, 1990). But recently, by examining five-day returns surrounding the release of the earnings announcements, Bhojraj, Hribar, Picconi, & McInnis (2009) show that firms that just beat analyst forecasts ("beaters") exhibit a short-term stock price benefit relative to firms that miss forecasts ("missers") even though beaters have a low earnings quality signal (e.g., below median changes in R&D) whereas missers have high earnings quality (e.g., above median changes in R&D). Further, such trend reverses over a three-year horizon. Their findings suggest that managerial myopia is punished by the capital market in a long term but not in a short run. While these studies document interesting and insightful results, their conclusions have been limited because the R&D change examined is not necessarily a sacrifice in order to achieve the short-term earnings target. Essentially, managerial myopia is sacrificing long-term growth for the purpose of meeting short-term goals (Porter, 1992). This concept has three aspects: (1) there should be underinvestment in long-term value creation projects; (2) the underinvestment should occur with the objective of meeting short-term goals; and (3) such underinvestment must be sub-optimal in the sense of impairing long-term growth and value creation. Previous literature generally uses R&D underinvestment to capture myopia, but such underinvestment might not occur with the objective of meeting current earnings - a violation to aspect (2). In terms of this, in this paper, we use managers' cutting R&D specifically to meet earnings targets as a setting to examine the market reactions to managerial myopia.

Following the research design of prior literature (Baber et al., 1991; Bushee, 1998; Goel & Ram, 2001), we sample firms for which earnings before R&D and taxes have declined relative to the prior year, but have declined by an amount that can be reversed by a reduction in R&D. By definition, these firms have the incentive, as well as the ability, to cut R&D in order to meet earnings targets. More importantly, if these firms do cut R&D, then most likely such cutting is for the objective of meeting earnings targets and therefore could be regarded as myopic. We then focus on two subgroups of firms: (1) firms that cut R&D and meet the previous year's earnings (hereafter, myopic cutters) and (2) firms that do not cut R&D, and thus miss the previous year's earnings (hereafter, non-cutters). If the market does not punish myopic R&D cutting, we should observe a better short-term stock price performance for subgroup (1) because subgroup (1) has systematically higher earnings surprises. If it turns out that Subgroup (1) has worse performance, however, the suggestion is that the capital market does punish myopic behavior because the only reason that subgroup (1) has higher earnings surprises than subgroup (2) is due to managerial myopia - cutting R&D to meet earnings targets.[2]

Applying an event study, we find that myopic cutters systematically underperform in a five-day window surrounding the release of the earnings announcement. This indicates that investors are able to see through the earnings manipulation by R&D cut and penalize such myopic behavior. We also estimate

[2] This sampling strategy makes it impossible to use zero as the earnings benchmark. Although analyst forecast is also a popular benchmark, analysts may change their forecasts from month to month. As a result, it is difficult for managers to make R&D cut decisions according to analysts' forecasts. Moreover, many analysts do not provide their forecasted R&D expenditure and thus make unavailable the forecasted earnings before R&D. This explains why we use earnings of the prior year rather than zero or analyst forecast as the benchmark in this study.

ordinary least squares (OLS) regression to control the factors that could influence five-day returns. The results show that myopic cutters still have significantly lower five-day returns after controlling variables identified in prior studies.

If the capital market is efficient and does discount managerial myopia, we should expect the discount to be higher for firms with more sophisticated investors because more sophisticated investors are better able to "see through" managers' myopic R&D cutting behavior and less likely to fixate on earnings. Therefore, we further examine whether investor sophistication affects the market reaction to the managerial myopia. We expect that managers in firms with more sophisticated investors are more likely to be punished by the market for cutting R&D to meet/beat short-term earnings targets. Consistent with our prediction, we find that the phenomenon of the capital market punishing managerial myopic behavior exists only in the sub-sample of firms with high investor sophistication. This finding further supports that the capital market would punish manager's myopic R&D cutting because investors are sophisticated enough to see through the behavior.

A question remained unsolved, however, is why managers still choose to behave myopically. Therefore, we further explore the incentives of managerial myopia. We find that CEOs who cut R&D to meet the previous year's earnings receive significantly higher cash pay (the sum of salary and annual bonus) and total pay (the sum of cash pay and noncash pay) after controlling other important determinants of CEO compensation. Our results indicate that the incomplete compensation contract is one of the reasons why CEO behaves myopically.

Our paper contributes to the literature in a number of ways. First, it has long been argued that the market pressure causes managers to behave myopically. This argument assumes that the capital market would not punish managers who behave myopically. Previous literature uses decreased R&D investment or a lower industry-adjusted R&D change (Bhojraj et al., 2009) to measure managerial myopia and provide mixed results. However, managers may reduce R&D investments for the objective of meeting some short-term goals and therefore could not capture managerial myopia defined in Porter (1992). In terms of this, we identify a specific setting in which managers' cutting R&D investment is most likely for meeting current period earnings so that we can better capture managers' myopic behaviors. Our results show significantly lower mean and median values of five-day returns for myopic cutters, suggesting that the capital market does penalize the myopic behavior of managers (e.g., cutting R&D to meet the previous year's earnings).

Second, manipulating real operations such as R&D investment is a popular way of earnings management (Bhagat & Bolton, 2008), but there are few studies on the economic consequences of real earnings management. Our study extends this stream of research by showing that the market attaches a lower value to firms engaging in myopic R&D cutting.

Finally, our results suggest that CEO compensation might be one of the possible reasons why CEOs involve in myopic behavior. In this aspect, our study provides a new explanation on managerial myopia and could contribute to the literature on both managerial myopia and CEO compensation.

The remainder of the paper is organized as follows. The next section discusses the background, the research motivation, and the related literature. Section III describes the sample and data. Results are reported in Section IV. Section V extends the results to examine the managerial incentive to act myopically, and Section VI concludes.

II. Literature and Hypothesis

A large amount of literature provides evidence of managerial myopia with respect to R&D spending. For example, R&D spending is significantly lower when the spending jeopardizes managerial ability to report positive earnings or increase income in the current period (Baber et al., 1991), or when CEOs are in the final years of their administrative tenure (Dechow & Sloan, 1991). Moreover, myopic R&D spending is more pronounced in firms that are held by institutional investors with a shorter investment horizon (Bushee, 1998). Similarly, managers are found to manipulate short-term earnings through R&D activities (Bhagat & Bolton, 2008; Jaffe, Trajtenberg, & Henderson, 1993). In an experimental setting, Bjojraj and Libby (2005) find that managers will make more myopic project choices in response to increased capital market pressure resulting from a pending stock issuance, holding constant agency frictions and other stock market pressures.

To examine whether the market punishes managers if managers do engage in myopic R&D activities, Jarrell & Lehn (1985) report that stock prices responded positively to 62 announcements (between 1973 and 1983) that firms were embarking on new R&D projects. Woolridge (1998) examines 45 announcements (between 1972

and 1984) involving expenditures for new as well as continuing R&D projects and reports positive share price responses. Chan et al (1990) examine share price responses to announcements of increased R&D spending. They find that, on average, such responses are positive even if increased R&D expenditures occur at the same time as a decline in earnings. Further, they discover that when their sample of announcements are divided up into those associated with high technology and those associated with low technology firms, positive stock price responses are associated with increased R&D expenditures for high technology firms whereas negative stock price responses are associated with increased R&D expenditures for low technology firms. This latter result suggests that the capital market not only treat R&D expenditures as long-lived investments but also do so in a discriminating fashion. However, the documented earnings decline is not necessarily due to the increased R&D. In other word, the R&D cutting here is not necessarily myopic. Similarly, Bhojraj et al (2009) find that stock market reaction is positive to beaters even though their change in R&D is above the median level for all firms. But the above-median change in R&D does not represent a decrease in R&D, and more importantly, the change in RD is not necessarily a sacrifice to achieve a short-term earnings target. Taken together, although prior studies examined the market reaction to change in R&D investments, they did not directly investigate market reaction to change in R&D investments because of managerial myopia (i.e. sacrificing long-term growth for the purpose of meeting short-term goals).

We argue that the capital market could see through managerial myopia and thus

penalize the behavior accordingly. Despite widespread allegations of stock market "short termism," research persuasively supports a view that capital markets consider R&D investments as significant value-increasing activities (Cheng, 2004). Further, market participants would search for methods to mitigate potential wasteful reduction of long-term profitable investment (Chhaochharia & Grinstein, 2007). For example, managers are less likely to cut R&D to reverse an earnings decline when institutional ownership is high. Specifically, institutional ownership serves to reduce pressures on managers for myopic investment behavior if institutional investors have low turnover and momentum trading (Bushee, 1998). Osma (2008) provides evidence suggesting that independent directors have sufficient technical knowledge to identify opportunistic reductions in R&D, and to efficiently constrain myopic R&D spending. In addition, the presence of financial analysts, auditors, and other experts who estimate R&D project values could lessen the information asymmetry that generates mispricing and therefore suppress managerial myopia (Chhaochharia & Grinstein, 2007). Managers could also credibly reveal their belief that the firm is undervalued by initiating stock repurchases or by accepting compensation contingent on project outcome (Meulbroek, Mitchell, Mulherin, Netter, & Poulsen, 1990). In line with this logic, we expect that:

H1: The capital market reacts negatively to the behavior of cutting R&D to meet earnings target.

The discussion leading up to H1 assumes that the investors are capable of searching for and analyzing information. However, as prior studies indicate, investor

sophistication varies across firms (Callen, Hope, and Segal 2005; Bartov, Radhakrishnan, and Krinsky 2000). Although the threshold of investor sophistication for an efficient capital market is unknown, we could empirically test whether the extent of investor sophistication matters. Sophisticated investors are more likely to see through the myopia R&D cut behavior than unsophisticated investors do. If the investors' reactions to managerial myopia varies across firms in a manner consistent with the effects of investor sophistication, it will increase the reliability of our empirical results. Following prior studies, we construct the second hypothesis as follows:

H2. The phenomena that the capital market reacts negatively to the behavior of cutting R&D to meet earnings target exists mainly in firms with sophisticated investors.

III. Empirical Analysis

A. Sample and Measures

Our sample consists of firm-year observations drawn from the *Compustat* Database from 1972 to 2008. The earliest year is set at 1972 because prior to that year relatively few firms on *Compustat* reported information on R&D outlays (Kothari et al., 2002). All price and returns data are from the *Center for Research in Security Prices (CRSP)*. To ensure that micro-cap or penny stocks did not bias our results, we dropped firms with assets less than $10 million or the share price less than $1. Utilities and banks are also omitted from our sample, because their financial statements tend to be different from those of other types of firms. As mentioned, we

include in our sample only firms that have both incentive and ability to cut R&D to meet short-term earnings. Thus, firms are excluded unless their earnings before R&D and taxes have declined relative to the prior year, but by an amount that can be reversed by a 20%[3] reduction in R&D. Specifically, we compute EBTRD (Earnings before Tax and R&D). Firms that do not satisfy the inequality "$-0.2*(RD_{t-1})<=(EBTRD_t-EBTRD_{t-1})<0$" are excluded. Furthermore, we exclude firms that cut R&D and missed the previous year's earnings[4]. Finally, observations were deleted if either: (1) *Compustat* reports missing values for sales, total assets, book value of equity, or market value of equity; or (2) data needed to compute the variables are missing. The sample-selection criteria yield a total of 2,691 observations, with 708 myopic cutters and 1,347 non-cutters.

We classify firms into categories based on whether they cut R&D and meet the previous year's earnings. We construct a dummy variable *CutRD*, which is 1 if managers cut R&D at year *t* (i.e., R&D expenditure is lower relative to the prior year) and earnings at year *t* are not less than that of year *t-1*. *CutRD* equals 0 if managers do not cut R&D at year *t*. Thus, *CutRD* in this paper is the measure of managerial myopia.

Testing our hypotheses also requires the measure of market reaction. To increase the robustness of our study, we use three different measures to capture market reaction: raw returns, market-adjusted abnormal returns, and size-adjusted abnormal returns.

[3] When the ratio of the distance from the earnings goal relative to the prior year's R&D $((EBTRD_{t-1}-EBTRD_t)/RD_{t-1})$ is higher than 20%, the probability of R&D cut is low (13.47%). This indicates that, if the ratio is high, it will be difficult for managers to cut R&D to meet earnings targets. To ensure that managers have both the incentive and the ability to cut R&D to meet the previous year's earnings, we require the ratio to be less than or equal to 20%. We also apply 10%, 15%, or 25% as the thresholds and get qualitatively similar results.

[4] If we include these firms in the sample and treat them as myopic cutters, the results remain unchanged.

All the returns are calculated using a five-day window that begins two days before the earnings announcement and ends two days after the earnings announcement. Five-day (adjusted) returns are calculated as the (adjusted) cumulative return in the five-day window. The market-adjusted (size-adjusted) return is calculated using daily *CRSP* returns, and is adjusted by subtracting the cumulative market return (market return of firms in the same *CRSP* size decile) over the same period.

B. Descriptive Statistics

Table I provides descriptive statistics separately for myopic cutters and non-cutters. For the mean values, the myopic cutters have slightly lower firm size (as indicated by *Total Assets* and *Market Value*), slightly higher book-to-market ratio (*BM*), significantly lower R&D investment (*RD*), earnings (*Earnings*), previous year's earnings (*Lag_Earnings*), and distance (*Distance*), as well as significantly higher earnings surprises (*Surprise*). For the median values, all the variables (except book-to-market ratio) show significant difference between myopic cutters and non-cutters.

C. Research Design

We first examine how investors react to myopic R&D cut by comparing abnormal returns of myopia cutters and non-cutters. Because myopic cutters have significantly higher earnings surprise than non-cutters (See Table I: t-statistics z-statistics of mean/median difference of *Surprise* is 14.669/36.181), the market reaction of myopic cutters should be more positive than that of non-cutters. Therefore, a determination that the market reaction to myopic cutters is more negative than that

toward non-cutters indicates that the investors punish the behavior of myopia R&D cut. Our research design provides a conservative way to detect the punishment of managerial myopia by investors.

To mitigate the concern that there might be many other factors affecting the abnormal returns, we further apply the regression method to examine the influences of R&D cut on the market reaction. Following Larker, Ormazabal, and Taylor (2011), we test our research question by estimating the following regression:

$$RET_{i,t} = \beta_0 + \beta_1 CutRD_{i,t} + \beta_2 ERDSurprise_{i,t} + \beta_3 \Delta RD_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 BM_{i,t} + \beta_6 Momentum_{i,t} + Firmandyearfixedeffects + \varepsilon \quad (1)$$

where:

i	=	Index of firm i;
t		Index of year t;
RET	=	Five-day (adjusted) returns are calculated as the (adjusted) cumulative return beginning two days before the earnings announcement and ending two days after the earnings announcement. The market-adjusted (size-adjusted) abnormal return is calculated using daily *CRSP* returns, and is adjusted by subtracting the cumulative market return (market return of firms in the same *CRSP* size decile) over the same period;
CutRD	=	A dummy variable that equals one if firms cut R&D to meet the previous year's earnings, and zero if firms do not cut R&D and fail to meet the previous year's earnings;
ERDSurprise	=	Earnings before R&D of year t minus earnings before R&D of year t-1;
△RD	=	R&D of year t minus R&D of year t-1;
SIZE	=	The natural logarithm of market value at the end of year t;
BM	=	Book value divided by market value;
Momentum	=	Market-adjusted return over the prior six months.

D. Empirical Results

Empirical results on Hypothesis 1 are reported in Table II. Panel A of Table II presents both the mean and median values of five-day returns[5] surrounding the release of earnings announcement for myopic cutters and non-cutters, respectively. It shows that the mean values of raw returns, size-adjusted returns, and market-adjusted returns are all negative for myopic cutters (two of them are significant at the 10% level). In contrast, for non-cutters, only the mean of market-adjusted returns is negative but insignificant. The median values of the five-day returns are all negative for both subgroups. More importantly, column (5) of Panel A reveals significantly lower mean values of five-day returns for myopic cutters (t-statistics of -2.613, -2.857, and -2.101). The values of the mean differences of the five-day returns between the two subgroups are around 1%, which is economically significant. Similarly, the median values of five-day returns are also significantly lower for myopic cutters (z-statistics of -2.461, -2.231, and -2.169). Because both the mean and median values of earnings surprises of myopic cutters are significantly higher (0.253 vs. -0.329 for mean values and 0.100 vs. -0.270 for median values, shown in Table 1), our results indicate that the capital market does penalize the myopic behavior of managers (e.g., cutting R&D to meet the previous year's earnings).

The more informative results are shown in Panel B of Table III, which presents the coefficient estimates for equation (1). In all three columns, the coefficients on *CutRD* are significantly negative (The coefficients on *CutRD* are -0.017, -0.014 and -0.015 respectively, all significant at 1% level), indicating that R&D cutters generally

[5] We also try three-day stock returns, and the (untabulated) results are qualitatively similar.

have lower abnormal returns than non-cutters. Our results further support the view that capital markets would punish managerial myopia.

The results for the control variables are generally consistent with prior literature. The positive coefficients on *ERDSuprise* are consistent with prior studies on earnings response coefficients (ERCs). The positive coefficients on *SIZE* and *BM* are consistent with Larker et al. (2011). The coefficients on *Momentum* are significantly positive, indicating the existence of momentum phenomena. Moreover, the coefficients on $\triangle RD$ are significant and positive in all the three columns.

IV. Effects of Investor Sophistication on Market Reaction to Managerial Myopia

Prior studies find that the investor sophistication is not homogenous in the capital markets. If investors of a firm are naive, they would be less likely to see through managers' myopic behavior and to punish accordingly. Following previous literature, we use the percentage of shares held by institutions[6]) (*Inst_Percent*) to proxy for investor sophistication (e.g., Hand 1990; Walther 1997; Bartov, Radakrishnan, and Krinsky 2000; Bradshaw, Bushee, and Miller 1994; Callen, Hope, and Segal 2005). Consistent with the extant literature, institutional investors comprise banks, insurance companies, and investment companies, including their managers, independent advisors, and others. The institutional holding data are from 13-f filings to the SEC, provided by CDA Spectrum database. Our sample for testing hypothesis 2 consists of 1,924 firm-year observations covering the years from 1972 to 2008.

[6] We use the number of institutions holdings shares as an alternative proxy for investor sophistication, and the empirical results remain qualitatively unchanged (untabulated). Moreover, we also use total asset size and analyst following as proxies for investor sophistication. The alternative measures of investor sophistication do not change our empirical results qualitatively (untabulated).

Table III reports descriptive statistics for variables used in the investor sophistication tests. The mean (median) value of raw returns is -0.001 (0.000). The mean and median values of market-adjusted (size-adjusted) returns are -0.003 (-0.006) and -0.007 (-0.008), respectively. This is consistent with the construction of our sample, which includes only firms suffering small decreases in earnings before R&D expenses. The mean of *CutRD* is 0.387, indicating that 38.7% of firms in our sample manage to meet or beat the prior year's earnings by cutting R&D. Similar to prior studies, the mean (median) value of *Inst_percent* is 0.449 (0.415). The remaining variables also seem to be reasonable and consistent with the literature. For example, the mean size of the sample firms is 5.647 and the average book-to-market ratio is 0.570.

We conduct sub-sample regressions to examine the effects of investor sophistication on the market reaction to managerial myopia. Specifically, we divide our sample into high-IS and low-IS sub-samples. The high-IS (low-IS) sub-sample consists of firm-years for which *Inst_Percent* is higher (lower) than the median in year *t*, thus representing the observations for which investors are more (less) sophisticated. By estimating the equation (1) in the strong/weak investor sophistication subgroups, respectively, we expect that our results hold in the high-IS sample. Because the threshold of investor sophistication ensuring the ability to see through the managerial behavior is unknown, we make no prediction on the results in low-IS sample.

The sub-sample regression results are presented in Table IV. It shows that the coefficients on *CutRD* are all significantly negative in high-IS sub-sample (t-statistics of -3.817, -3.248, and -4.304, respectively), while insignificant in low-IS sub-sample (t-statistics of -0.529, -0.429, and -0.312, respectively). The results suggest that investors of companies with high investor sophistication react negatively to myopic R&D cut. However, we fail to find empirical evidence that managerial myopia is punished when investor sophistication is low. This result indicates that the investors' reactions to managerial myopia vary across firms in a manner consistent with prior finance theory and findings.

V. Extension: Managerial Incentive to Behave Myopically

The above findings suggest that the market is efficient, and thus might not pressure managers to cut R&D in a way that is myopic. A question that has remained unanswered, however, is what causes managers to act myopically. Therefore, in this section we further examine the possible reasons for managerial myopic R&D cut.

Earnings is an important determinant of top executive compensation, because earnings-based performance measures help to shield executives from fluctuations that are beyond their control (Donaldson & Preston, 1995). Missing an earnings benchmark may become a signal of poor performance that induces the compensation committee to penalize managers. Consistent with this argument, Matsunaga and Park (2001) find that CEOs' annual bonuses are positively related to the likelihood of meeting a quarterly earnings benchmark. Further, meeting the earnings benchmark could constitute a public signal that allows the compensation committee to justify

higher compensation levels to shareholders and, thereby, to overcome political constraints on CEO compensation (Porter & Kramer, 2006). Thus, by meeting earnings targets, managers are able to increase their personal wealth in the form of cash pay. In view of this, we expect compensation to be a potential reason of managerial myopia.

In addition to cash pay, we also examine whether managerial myopia affects managers' total pay and noncash pay. Total pay is the sum of cash pay and noncash pay, and thus is a more comprehensive measure of CEO compensation. Noncash pay is the sum of the value of equity grants during the year, the fringe benefits, and other long-term incentive plans, with stock options valued at the end of the fiscal year using the Black-Scholes 1973 model adjusted for dividends. Previous literature indicates that noncash pay is an important component of CEO incentives (Murphy, 1999).

We test our prediction by estimating the following model:

$$\Delta pay_{i,t} = \alpha_0 + \alpha_1 CutRD_{i,t} + \alpha_2 \Delta ROA_{i,t} + \alpha_3 RET_{i,t} + \alpha_4 SIZE_{i,t-1} + \alpha_5 Q_{i,t-1} + \alpha_6 LEV_{i,t-1} + \alpha_7 Ownership_{i,t-1} + \alpha_8 Tenure_{i,t} + \zeta \quad (2)$$

where:

i	=	Index of firm i;
j	=	Index of year t;
$\triangle pay_{i,t}$	=	The change of CEO's total pay, the change of CEO's cash pay, or the change of CEO's noncash pay. The change of CEO pay (total pay, cash pay, or noncash pay) is calculated as the logarithm of pay (total pay, cash pay, or noncash pay) in year t minus the logarithm of CEO pay (total pay, cash pay, or noncash pay) in year t-1;
$Cash\ Pay_{i,t}$	=	CEO cash pay, including salary and annual bonuses;
$Noncash\ Pay_{i,t}$	=	CEO noncash pay, including value of equity grants during the year, fringe benefits, and other long-term incentive plans;

$Total\ Pay_{i,t}$	=	The sum of *cash pay* and *noncash pay*;
$\triangle ROA_{i,t}$	=	$ROA_{i,t}$ -$ROA_{i,t-1}$;
$ROA_{i,t}$	=	Net income divided by total assets;
$RET_{i,t}$	=	Annual stock return;
$SIZE_{i,t}$	=	Logarithm of total assets;
$Q_{i,t}$	=	The book value of assets minus the book value of equity, plus the market value of equity, scaled by the book value of assets;
$LEV_{i,t}$	=	Total debts divided by total assets;
$Ownership_{i,t}$	=	CEO ownership as a percentage of shares outstanding;
$Tenure_{i,t}$	=	Number of years as the CEO of the firm.

The model and control variables in (2) are based on previous literature (Cheng, 2004; Cheng & Indjejikian, 2009; Sloan, 1993). The dependent variable $\triangle pay_{i,t}$ could be the change of CEO cash pay, the change of CEO total pay, or the change of noncash pay. We use a natural logarithmic transformation to control for skewness in CEO compensation[7]. If managers who cut R&D to meet the previous year's earnings receive more compensation, then γ_1 would be significantly positive.

We control $\triangle ROA$ and *Return* because accounting and stock performance measures have positive effects on CEO compensation (Baber, Janakiraman, & Kang, 1996; Lambert & Larcker, 1987). We also control other variables that have been identified by previous literature as being associated with CEO compensation (Cheng & Indjejikian, 2009; Hartzell & Starks, 2003; Murphy, 1999). These include firm-level characteristics such as size, Tobin's Q, leverage, market-to-book ratio, and CEO characteristics such as equity ownership and CEO tenure.

We test our prediction on a sample of 248 firm years from 1993–2008[8] that have both incentive and ability to cut R&D in order to meet the previous year's earnings.

[7] The results remain unchanged when this transformation is not applied.
[8] The earliest year is set at 1993 because *Execucomp* provides executive compensation data since 1992 and we need to calculate the change of compensation using one-year-lag data.

We obtain the annual compensation information from the *Execucomp* database. Since we are analyzing the change in compensation, we require that a firm have two consecutive years of compensation data. For this reason, as well, we restrict our sample to those executives who have been the CEO for both of the consecutive years. The other sample selection criteria are the same as section III.

The results are shown in Table V. Columns (1), (2), and (3) report the results of total pay, cash pay and noncash pay, respectively. In Columns (1) and (2), the coefficients on *CutRD* are positive and significant (p-value less than 0.10), indicating that managers generally receive benefits from acting myopically. In Column (3), the coefficient on *CutRD* is negative but insignificant. Overall, our results indicate that compensation, especially cash compensation, might be one of the possible reasons for managerial myopia.

VI. Conclusions

Many academics and practitioners believe that myopia is a first-order problem faced by the modern firm (Edmans, 2009), and it is concern for the stock price that leads to myopia. Using managers' R&D cutting to meet short-term earnings targets as a setting, our study examines whether the market actually discounts managerial myopia.

The study is based on a sample of U.S. firms with declined pre-tax, pre-R&D earnings relative to the prior year—but earnings that have declined by an amount that can be reversed by cutting 20% of the previous year's R&D. We investigate whether the market reacts negatively to managerial myopia around the earnings announcement

date, and whether it attaches a lower value to firms that cut R&D myopically. Using five-day returns surrounding the announcement of earnings as an indicator of market reaction, we provide empirical evidence suggesting that the market is not myopic, and that it does penalize firms if managers engage in myopic R&D cutting for the purpose of short-term goals. Moreover, our further tests indicate that the phenomenon of investors punishing managerial myopia can be detected only when investor sophistication is high.

Given that the capital market could “see through” managerial myopia, we further explore why managers continue to behave myopically. We conduct regressions to examine the effects of managerial myopia on CEO cash pay, noncash pay, and total pay. Our results suggest that CEOs who cut R&D myopically receive significantly higher total pay and cash pay, indicating that the incomplete compensation contract is one of the reasons for managerial myopia.

Although researchers argue that it cannot be true that the market is myopic, empirical evidence is limited. By investigating the market reaction to the managerial myopia, our study fills the niche and contributes to the literature on managerial myopia. Further, this study extends the literature on the economic consequences of real earnings management by indicating that the market discounts real earnings management behaviors.

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Table I Descriptive Statistics for Myopic Cutters and Non-Cutters

This table presents the summary statistics for the two subgroups: firms that cut R&D to meet the previous year's earnings (myopic cutters), and firms that do not cut R&D and fail to meet the previous year's earnings (non-cutters). The sample includes firm-years for which earnings before R&D and taxes have declined relative to the prior year, but by an amount that can be reversed by a 20% reduction in R&D. The t-statistics (z-statistics) of the mean (median) differences are also provided. All values are obtained using *Compustat* data for the given fiscal year. *Total Assets* is *Compustat* item #AT. *Market Value* is shares outstanding (#CSHO) multiplying fiscal year closing stock price (#PRCC_F). *BM* is book value (#CEQ) divided by market value. *RD* is research and development expenditure (#XRD) divided by total asset. *Earnings* (*Lag_Earnings*)) is earnings per share before extraordinary item (#EPSPX) of a given fiscal year (the prior fiscal year). *Surprise* is earnings surprise, measured as earnings minus Lag_Earnings. *Distance* is change of earnings before R&D divided by R&D at the beginning of the fiscal year. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively, two-tailed.

	Myopic Cutters			Non-Cutters			Difference	
	(1)	(2)	(3)	(4)	(5)	(6)	(1)-(4)	(2)-(5)
Variable	Mean	Median	Std Dev.	Mean	Median	Std Dev.	t-statistics	z-statistics
Total Assets	2270.010	80.808	12296.200	2626.440	122.225	12927.120	-0.638	-4.686***
Market Value	1997.200	118.262	7374.880	1977.780	190.230	6681.930	0.062	-5.525***
BM	0.648	0.494	0.541	0.622	0.505	0.481	1.227	0.125
RD	0.142	0.086	0.156	0.153	0.099	0.162	-1.592	-2.852***
Earnings	0.347	0.070	1.640	0.596	0.340	1.695	-3.398***	-4.839***
Lag_Earnings	0.094	-0.030	1.766	0.925	0.610	1.846	-10.465***	-11.880***
Surprise	0.253	0.100	1.503	-0.329	-0.270	0.882	14.669***	36.181***
Distance	0.084	0.077	0.056	0.095	0.091	0.058	-4.652***	-4.614***

Table II Market Reaction to Managerial Myopia

Panel A presents the five-day returns surrounding the earnings announcement for myopic cutters and non-cutters. The raw return is calculated using daily CRSP returns. The market-adjusted (size-adjusted) abnormal return is calculated using daily *CRSP* returns and adjusted by subtracting the cumulative market return (market return of firms in the same *CRSP* size decile) over the same period. Five-day (adjusted) returns are calculated as the (adjusted) cumulative return beginning two days before the earnings announcement and ending two days after the earnings announcement. T-statistics or z-statistics are presented in the brackets. Panel B presents results from a regression of five-day returns surrounding the earnings announcement on myopic R&D cut and control variables. *CutRD* is a dummy variable that equals one if firms cut R&D to meet the previous year's earnings, and zero if firms do not cut R&D and fail to meet the previous year's earnings. *ERDSurprise* is earnings before R&D of a given year minus earnings before R&D of the prior fiscal year, $\triangle RD$ is R&D of year t minus R&D of year t-1, *SIZE* is the natural logarithm of market value, *BM* is book value divided by market value, and *Momentum* is the market-adjusted return over the prior six months. Heteroskedastic-robust and cluster-adjusted t-statistics appear in brackets. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively, two-tailed.

Panel A. Event Day Returns

Type of Returns	Myopic Cutters N=805		Non-Cutters N=1886		Difference	
	(1) Mean	(2) Median	(3) Mean	(4) Median	(1)-(3) (t-statistics)	(2)-(4) (z-statistics)
Raw Returns	-0.005	-0.003**	0.006**	0.000	-0.011***	-0.003**
	[-1.442]	[-2.584]	[2.513]	[-0.483]	[-2.613]	[-2.461]
Market-Adjusted Abnormal Returns	-0.013***	-0.014***	-0.002	-0.004***	-0.011***	-0.012**
	[-3.830]	[-6.848]	[-1.056]	[-3.775]	[-2.857]	[-2.231]
Size-Adjusted Abnormal Return	-0.006*	-0.009***	0.003	-0.003**	-0.009**	-0.006**
	[-1.706]	[-4.936]	[1.126]	[-2.231]	[-2.101]	[-2.169]

Panel B. Cross-Sectional Variation in Event Day Returns

Variable	(1) Raw Returns	(2) Market-Adjusted Abnormal Returns	(3) Size-Adjusted Abnormal Returns
CutRD	-0.017***	-0.014***	-0.015***
	[-3.946]	[-3.231]	[-3.496]
ERDSurprise	0.009**	0.008**	0.007*
	[2.217]	[2.102]	[1.817]
△RD	0.009*	0.008*	0.009*
	[1.798]	[1.675]	[1.834]
SIZE	0.005***	0.003***	0.003***
	[4.009]	[3.502]	[3.874]
BM	0.018***	0.016***	0.017***
	[3.186]	[2.915]	[4.308]
Momentum	0.014**	0.017***	0.008
	[2.299]	[2.774]	[1.314]
Constant	-0.015**	-0.021***	-0.028***
	[-2.288]	[-3.190]	[-4.379]
Firm Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Observations	2,639	2,639	2,639
Adjusted R^2	0.014	0.012	0.013

Table III Summary Statistics for the Investor Sophistication Tests

This table presents the descriptive statistics of the data used in the tests determining how investor sophistication affects market reaction to managerial myopia. The sample consists of 1,924 firm-year observations covering the years from 1972 to 2008. All variables except dummy variables are winsorized at the 1st and 99th percentile values. The raw return is calculated using daily *CRSP* returns. The market-adjusted (size-adjusted) abnormal return is calculated using daily CRSP returns and adjusted by subtracting the cumulative market return (market return of firms in the same *CRSP* size decile) over the same period. Five-day (adjusted) returns are calculated as the (adjusted) cumulative return beginning two days before the earnings announcement and ending two days after the earnings announcement. *CutRD* is a dummy variable that equals one if firms cut R&D to meet the previous year's earnings, and zero if firms do not cut R&D and fail to meet the previous year's earnings. *Inst_Percent* is the percentage of shares held by institutions at the end of given fiscal year, *ERDSurprise* is earnings before R&D of given year minus earnings before R&D of last fiscal year, *△RD* is R&D of a given year minus R&D of the prior fiscal year, *SIZE* is the natural logarithm of market value, *BM* is book value divided by market value, and *Momentum* is the market adjusted return over the prior six months.

Variable	(1) Mean	(2) Std Dev.	(3) 25^{th}	(4) Median	(5) 75^{th}
Raw Returns	-0.001	0.098	-0.054	0.000	0.050
Market-Adjusted Returns	-0.003	0.093	-0.054	-0.007	0.046
Size-Adjusted Returns	-0.006	0.087	-0.055	-0.008	0.042
CutRD	0.387	0.487	0.000	0.000	1.000
Inst_Percent	0.449	0.353	0.213	0.415	0.653
ERDSurprise	-0.175	0.387	-0.186	-0.075	-0.021
△RD	-0.014	0.447	-0.114	0.020	0.149
SIZE	5.647	1.995	4.238	5.352	6.773
BM	0.570	0.412	0.274	0.478	0.749
Momentum	-0.003	0.379	-0.229	-0.050	0.133

Table IV Effects of Investor Sophistication on Market Reaction to Managerial Myopia

This table presents the results on the effects of investor sophistication on market reaction to managerial myopia. The dependent variable is five-day (adjusted) returns surrounding the earnings announcement. Five-day (adjusted) returns are calculated as in Table II. We divide the full sample into two sub-samples: a sub-sample of firms with high investor sophistication (High-IS) and a sub-sample of firms with low investor sophistication (Low-IS). A firm is identified as being with high (low) investor sophistication if its *Inst_Percent* is higher (lower) than the sample median. Other variables follow the definitions in Table III. Column (1) reports the results of the regression using the raw returns, regressions in Column (2) use the market-adjusted abnormal returns, and regressions in Column (3) use the size-adjusted abnormal returns. Heteroskedastic-robust and cluster-adjusted t-statistics appear in brackets. *, **, *** denote two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1) Raw Returns		(2) Market-Adjusted Abnormal Returns		(2) Size-Adjusted Abnormal Returns	
	High IS	Low IS	High IS	Low IS	High IS	Low IS
CutRD	-0.024**	-0.004	-0.023***	-0.003	-0.031***	-0.002
	[-3.187]	[-0.529]	[-3.248]	[-0.429]	[-4.304]	[-0.312]
ERDSurprise	0.018***	0.000	0.016**	0.000	0.021***	0.009
	[2.819]	[0.939]	[2.583]	[1.335]	[3.419]	[0.889]
△RD	0.015**	-0.000	0.017**	-0.000	0.024***	-0.016
	[2.029]	[-0.119]	[2.472]	[-0.362]	[2.862]	[-1.385]
SIZE	0.006***	0.002	0.002*	0.002	0.004***	0.003
	[3.481]	[0.866]	[1.743]	[1.044]	[2.930]	[1.233]
BM	0.020**	0.010	0.032***	0.010	0.046***	0.017*
	[2.318]	[1.257]	[2.518]	[1.425]	[3.535]	[1.883]
Momentum	0.012	0.025**	0.017	0.022**	0.019	0.004
	[1.376]	[2.100]	[1.541]	[1.970]	[1.637]	[0.449]
Constant	-0.055***	-0.042*	-0.020	-0.052**	-0.030*	-0.018
	[-2.656]	[-1.777]	[-1.398]	[-2.291]	[-1.906]	[-1.254]
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	962	962	962	962	962	962
Adjusted R^2	0.016	0.004	0.011	0.008	0.019	0.005

Table V CEO Compensation and Managerial Myopia

This table presents the results of the association between managerial myopia and CEO compensation. The dependent variables are the change of CEO's total pay, cash pay, and noncash pay. Cash pay is the sum of salary and annual bonus. Noncash pay is the sum of the value of equity grants during the year, fringe benefits, and other long-term incentive plans, with stock options valued at the end of the fiscal year using Black-Scholes 1973 model adjusted for dividends. Total pay is the sum of cash pay and noncash pay. $\triangle ROA$ is change of ROA. *ROA* is calculated as net income divided by total assets. *SIZE* is the logarithm of total assets. *Q* is calculated as the book value of assets minus the book value of equity, plus the market value of equity, scaled by the book value of assets at year t. *LEV* is total debts divided by total assets. *Ownership* is the CEO ownership as a percentage of shares outstanding. *Tenure* is the number of years as CEO of the firm. *RET* is annual stock return. In Columns (1), (2), and (3), the dependent variables are CEO's total pay, cash pay, and noncash pay, respectively. Heteroskedastic-robust and cluster-adjusted t-statistics appear in brackets. *, **, *** denote two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Variable	(1) △Total Pay	(2) △Cash Pay	(3) △Noncash Pay
CutRD	0.194*	0.109**	0.330
	[1.917]	[2.148]	[0.547]
$\triangle ROA_{i,t}$	-0.601	-0.243	-0.868
	[-1.216]	[-0.971]	[-1.497]
$RET_{i,t}$	0.148	0.159***	-0.073
	[0.621]	[3.009]	[1.217]
$SIZE_{i,t-1}$	-0.017	0.020	-0.046
	[-0.871]	[0.952]	[-1.497]
$Q_{i,t-1}$	0.028	-0.011	0.049
	[1.274]	[-0.971]	[1.531]
$LEV_{i,t-1}$	0.547*	0.076	1.159*
	[1.947]	[0.987]	[1.831]
$Ownership_{i,t-1}$	-0.575	1.460***	-4.948**
	[-0.871]	[4.284]	[-2.245]
$Tenure_{i,t}$	0.010	-0.010**	0.050**
	[0.462]	[-2.127]	[2.145]
Constant	-0.297	-0.278	-0.350
	[-1.232]	[-1.031]	[-1.409]

Firm Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Observations	248	248	248
Adjusted R^2	0.005	0.140	0.017