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Do Capital Markets Punish Managerial Myopia? Evidence from Myopic Research and Development Cuts

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Abstract

The literature provides conflicting arguments and mixed results regarding whether capital markets punish managerial myopia. Using managers cutting research and development (R&D) investments to meet short-term earnings goals as a research setting, this study reveals that capital markets penalize managerial myopia, especially for firms with high investor sophistication. Moreover, the negative market reactions to managerial myopia are weaker for firms with overinvestment problems than for those without such problems. Overall, the results support the notion that security markets are not shortsighted. In further analysis, we document that compensation, especially earnings-based compensation, may cause managers to behave myopically. Our study contributes to the literature, reconciling previously mixed findings by capturing managers' myopic behavior in a more targeted way and showing that markets punish myopic R&D cutting.

I. Introduction

Defined as managers' desire to achieve a high current stock price by inflating current earnings at the expense of long-term performance (Stein (1989), Bhojraj and Libby (2005)), "managerial myopia" is a critical problem faced by modern firms (Edmans (2009)). Graham, Harvey, and Rajgopal (2005) document that 78% of executives would forgo a project with a positive net present value (NPV) if the project would cause them to miss short-term earnings targets. Empirical studies of myopic managerial behavior focus on research and development (R&D) expenditure and provide evidence of managers myopically cutting R&D investments to achieve various income objectives (Baber, Fairfield, and Haggard (1991), Cooper and Selto (1991), Dechow and Sloan (1991), Jacobs (1991), Bange and De Bondt

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(1998), Bens, Nagar, and Wong (2002), Roychowdhury (2006), Asker, Farre-Mensa, and Ljungqvist (2011), and Kraft, Vashishtha, and Venkatachalam (2018)).

The origins of managerial myopia have been debated, and central to the debate is the view that U.S. equity markets induce corporate managers to behave myopically (Jacobs (1991), Porter (1992)). This view arises from the belief that investors cannot see beyond current earnings and therefore depress stock prices when any short-term earnings reduction occurs. Because R&D investments are expensed under current Generally Accepted Accounting Principles (GAAP), managers have incentives to avoid such investments despite their long-term payoffs.[1] Essentially, managers underinvest in R&D to create the impression that their firms' current and future profitability is greater than it actually is, to boost current share prices (Stein (1989)). Hence, managers are pressured into sacrificing long-term performance for short-term performance to meet stock market expectations and secure impatient capital.

Prominent CEOs have expressed concerns about the pressure imposed by capital markets. For example, Anne Mulcahy, former chairperson and CEO of Xerox, stated that focusing on short-term performance is one of "the most dysfunctional things" in the marketplace and that it may hurt U.S. firms in the long run.[2] Google has declined to provide frequent earnings guidance, citing a desire to avoid losing focus on its long-term goals (Gigler, Kanodia, Sapra, and Venugopalan (2009)). Regulators share such concerns. For example, an independent commission established by the U.S. Chamber of Commerce recommends discontinuing quarterly earnings guidance, describing this move as an essential first step in shifting capital markets' focus away from quarterly results and toward companies' long-term performance (Cheng, Subramanyam, and Zhang (2007)). Recent empirical studies on earnings guidance, analyst coverage, and takeover protection support the previous concerns, which are shared by industries and regulators (Zhao, Chen, Zhang, and Davis (2012), He and Tian (2013), Hu, Hwang, and Jiang (2014), and Kim, Su, and Zhu (2017)).

However, studies provide mixed results as to whether capital markets are myopic (Houston, Lev, and Tucker (2010)). If capital markets are shortsighted, such that managers are pressured to behave myopically, we expect positive short-term stock price reactions to managers' myopic behavior.[3] "Managerial myopia" refers to the sacrifice of long-term growth to meet short-term goals (Porter (1992)). This phenomenon has three requirements: i) underinvestment in long-term value creation projects, ii) the objective of this underinvestment to meet short-term goals, and iii) the sub-optimal nature of underinvestment, in the sense of impairing long-term growth and value creation. Using different measures and settings, empirical

[1]We acknowledge that managers may not always give up R&D projects for short-term benefits. On the one hand, capital markets reward firms that meet or beat their earnings targets. On the other hand, capital markets also value R&D investments. Hence, managers may need to trade-off between investing in long-term projects while missing their earnings target and forgoing valuable long-term projects to meet or beat their earnings target.

[2]Information source: https://knowledge.wharton.upenn.edu/article/the-cow-in-the-ditch-how-anne-mulcahy-rescued-xerox/.

[3]In the long run, even shortsighted investors are likely to realize the unfavorable effects of managerial myopia and thus react negatively.

studies offer mixed results. Some scholars find that stock markets react positively to announcements of R&D increases (Jarrell and Lehn (1985), Woolridge (1988)), even when such announcements coincide with earnings disappointments (Chan, Martin, and Kensinger (1990)), suggesting that capital markets indeed reward R&D investments. While these studies document interesting and insightful results, they only examine market responses to R&D increases.

Although we could deduce from these studies that markets react negatively to R&D decreases, stock market reactions to myopic R&D decreases remain unclear.[4] Using U.K. data from 1989 to 2002, Osma and Young (2009) find that the sensitivity of 1-year returns to earnings increases is lower if such increases are likely to come from myopic R&D cuts. They focus on how managerial myopia influences earnings response coefficients rather than how markets react to managerial myopia. A more relevant study is that of Bhojraj, Hribar, Picconi, and McInnis (2009), which shows that managerial myopia is punished by capital markets in the long term but not in the short term. Bhojraj et al. (2009) use low earnings quality that nonetheless beats earnings targets to capture myopic behavior. In particular, firms are considered to have low earnings quality if: i) their discretionary accruals are above the median level for all firms in the same year and ii) changes in R&D or advertising are below the median level of all firms in that year. However, below-median changes in R&D do not necessarily constitute underinvestment,[5] nor are they necessarily made to meet short-term earnings targets, because meeting or beating targets may result from discretional accruals or advertising decreases. Thus, managerial myopia is not well captured in Bhojraj et al. (2009). Overall, relevant studies provide mixed findings.

In this study, we first sample firms for which earnings before R&D and taxes declined relative to the previous year but by an amount that could be reversed by a reduction in R&D. By definition, all of these firms are suspected of having myopic problems, because they have both the incentive and the ability to cut R&D to meet earnings targets. Managers of such firms have two options, namely to cut or not to cut R&D. If they choose to cut R&D, they are very likely to beat their earnings targets. Otherwise, they will miss their earnings targets. That is, if these firms decrease their R&D, such cuts are most likely made to meet earnings targets and, therefore, may be regarded as myopic. We then focus on two subgroups of firms: i) firms that cut R&D (labeled "myopic cutters" hereafter) and meet their previous year's earnings and ii) firms that do not cut R&D (labeled "non-cutters" hereafter) and fail to meet their previous year's earnings. According to our classification, non-cutters are those that would have been able to meet or beat their earnings targets had they chosen to decrease R&D. In contrast, myopic cutters are firms that would have

[4]Stock market reactions to myopic R&D decreases (i.e., cutting R&D for short-term benefits) may be either positive or negative. On the one hand, the markets may reward firms for managing to meet their earnings targets. On the other hand, the markets may punish firms for cutting valuable, long-term projects.

[5]Given the wide variation across industries in R&D changes, the median level of R&D change for all firms is unlikely to be the optimal level of R&D change for any given firm. Therefore, the use of the median level as the benchmark to judge whether one firm's R&D change is a form of underinvestment raises some concerns. For example, if the median level of R&D change is 10%, then a firm is classified as myopic even if it increases its R&D investments by 8%.

missed their earnings targets had they maintained their prior R&D investment levels. If markets do not punish myopic R&D cuts, we should observe better short-term stock price performance for myopic cutters than for non-cutters, because they exhibit higher earnings surprises. Conversely, if myopic cutters show worse performance, this suggests that capital markets do punish myopic behavior, as myopic cutters have higher earnings surprises than non-cutters because of managerial myopia (i.e., cutting R&D to meet earnings targets).[6] We believe that our design provides a more appropriate setting to capture managers' myopic behavior than those of other studies.

Conducting an event study, we find that myopic cutters systematically underperform in a 5-day window surrounding the earnings announcement date. This observation indicates that investors can see through earnings manipulation by means of R&D cuts and penalize such myopic behavior. We also estimate ordinary least squares (OLS) regressions to control for the factors influencing 5-day returns. When we include the control variables identified in prior studies, the results show that myopic cutters have significantly lower 5-day returns than non-cutters.

If capital markets are efficient and do discount stock value in response to managerial myopia, we expect the discount to be greater for firms with more sophisticated investors, as these investors are better able to "see through" managers' myopic R&D-cutting behavior. Therefore, we further examine whether investor sophistication affects market reactions to managerial myopia. Consistent with our prediction, we find that adverse market reactions to managerial myopia exist only in firms with high investor sophistication. This finding supports the proposition that capital markets with sophisticated investors punish managers' myopic R&D cutting.

However, why myopic cutters opt to behave myopically and risk being punished by stock markets remains an unsolved question. We further explore the incentives for managerial myopia by examining CEO compensation. We find that myopic cutters receive significantly higher earnings-based pay (i.e., annual bonuses) and total pay (the sum of earnings-based pay and non-earnings-based pay) than non-cutters after controlling for other determinants of CEO compensation. Our results suggest that earnings-based compensation produces the unintended effect of myopic managerial behavior, thus supporting incomplete contract theory[7] (Hart and Moore (1988)).

Our research contributes to the literature in several ways. First, it has long been argued that market pressure causes managers to behave myopically. If this is true, we should observe positive market reactions to managers' myopic behavior.

[6]This testing strategy makes it impossible to use 0 as the earnings benchmark, because earnings surprises (i.e., earnings changes) are incomparable between firms. Furthermore, although analyst forecast is a popular benchmark, analysts may change their predictions from month-to-month. This makes it difficult for managers to base R&D cut decisions on such forecasts. Moreover, most analysts do not provide firms' R&D expenditure forecasts, and earnings forecasts before R&D are unavailable. Therefore, we use previous year earnings rather than 0 or analyst forecasts as the benchmark in this study.

[7]A complete contract is one in which each party is able to specify their rights and duties in every possible future state of the world. However, a complete contract does not exist in reality, either because the state of the world is not observable by all parties or because the cost of processing and using the relevant information is too high.

However, the empirical literature (e.g., Jarrell and Lehn (1985), Woolridge (1988), Chan et al. (1990), Bhojraj et al. (2009), Osma and Young (2009), and Tong and Zhang (2014)) provides mixed results. Some studies (Jarrell and Lehn (1985), Woolridge (1988)) find that stock markets reward R&D increases, but they do not address how markets react to R&D decreases and especially myopic R&D decreases. Osma and Young (2009) examine myopic R&D cuts; however, they only focus on earnings response coefficients and do not provide direct evidence of how markets respond to managerial myopia. In addition, Bhojraj et al. (2009) find that capital markets punish managerial myopia only in the long term, suggesting that markets pressure managers to engage in myopic behavior. However, as mentioned previously, their measurement do not adequately capture managerial myopia.[8] Our study contributes to this line of research by reconciling previously mixed findings, as our setting enables us to capture managers' myopic behavior in a more targeted way. Additionally, by constructing a specific setting in which R&D cuts are likely to have been made to meet earnings targets, we provide a better measure of managerial myopia.

Second, manipulating real operations, such as R&D investments, is a common method of earnings management (Graham et al. (2005)). However, few studies examine the economic consequences of real earnings management.[9] Our study extends this line of research by showing that markets place less value on firms that engage in myopic R&D cutting in the short term.

Finally, our results suggest that CEO compensation, especially earnings-based compensation, may be a factor in CEOs' myopic behavior. In this respect, our study provides novel empirical evidence for the drivers of managerial myopia and contributes to the literature on managerial myopia and CEO compensation (e.g., Matsunaga and Park (2001), Bhojraj et al. (2009), and O'Connor, Rafferty, and Sheikh (2013)).

II. Literature and Hypotheses

A. Literature Review

The literature provides evidence of managerial myopia with respect to R&D spending. It is documented that R&D spending is significantly lower when such spending jeopardizes managers' ability to report positive/increased earnings in the current period (Baber et al. (1991), Roychowdhury (2006)) or when CEOs are in the final years of their administrative tenure (Dechow and Sloan (1991)). Furthermore, Bens et al. (2002) find that firms experiencing employee stock option exercises divert resources from real investment projects to finance the share repurchases resulting from the exercises.

Among the factors linked to managerial myopia, the transient nature of capital markets receives the most attention. It is argued that pressure from capital markets motivates managers to meet the expectations of Wall Street, even if doing so would

[8]Please refer to pages 2–3 for a detailed analysis of prior studies.

[9]One exception is Gunny (2010), who finds that firms use real earnings management to attain current period benefits that allow them to perform better in the future or signal inside information to outsiders.

require costly changes in real activities, such as myopically cutting R&D investments (e.g., Zhao et al. (2012), He and Tian (2013), Hu et al. (2014), and Kim et al. (2017)).

Empirical studies generally find that managers engage in more (less) myopic behavior in response to increased (decreased) capital market pressure. Specifically, managers are more likely to cut R&D investments to avoid an earnings decline when they foresee a stock issuance (Bhojraj and Libby (2005), Cohen and Zarowin (2010)), when institutional investors have high portfolio turnover and engage in momentum trading (Bushee (1998)), or when a threat from the takeover market exists. Similarly, He and Tian (2013) show that firms with greater analyst coverage generate fewer and lower quality patents, which suggests that financial analysts, as key information intermediaries in public equity markets, exert pressure on managers to meet short-term goals and consequently impede firms' investment in long-term innovative projects. Hu et al. (2014) find that when earnings guidance ceases, managers experience less pressure to manage reported earnings to meet guidance figures and thus can focus on actions that secure long-term value.

Another line of research investigates how capital markets react to managers' R&D investment decisions, with mixed results. Several studies document that returns are positively associated with the announcements of R&D projects (Jarrell and Lehn (1985), Woolridge (1988), and Chan et al. (1990)), which suggests that markets indeed reward management decisions that are consistent with long-term value creation. If capital markets are not shortsighted, we should also observe significant negative returns following myopic R&D cuts. Nevertheless, Bhojraj et al. (2009) find that stock market reactions to firms beating their targets are positive, even when the firms exhibit low earnings quality (measured by below-median changes in R&D, below-median changes in advertising, and above-median changes in discretionary accruals), indicating that capital markets do not punish managers' myopic behavior immediately. However, below-median changes in R&D do not necessarily represent underinvestment. More importantly, given that Bhojraj et al. (2009) combine R&D, advertising, and discretional accruals in their measurement, below-median changes in R&D do not necessarily represent a sacrifice made to achieve short-term earnings targets and, therefore, may not reflect managerial myopia. Overall, although these studies examine market reactions to changes in R&D investment, few directly investigate market responses to managerial myopia (i.e., sacrificing long-term growth to meet short-term goals).

B. Hypothesis Development

Research supports the notion that capital markets view R&D investments as significant, value-increasing activities (Cheng (2004), He, Tong, and Zhang (2011), and Chen, Ni, and Tong (2016)). In line with this logic, cutting R&D projects should be punished by capital markets. The dilemma is that firms involved in myopic R&D decreases may manage to meet or beat their earnings targets. If markets are misled and consequently give firms credit for meeting short-term earnings, we should observe more favorable market reactions to firms that decrease R&D myopically. In contrast, if markets can see through such manipulations, more negative market responses are expected.

We argue that capital markets are able to see through managerial myopia primarily because certain market participants search for methods to identify myopic behavior and thereby mitigate the potential wasteful reduction of profitable long-term investments (Chhaochharia and Grinstein (2007)). These market participants include institutional investors, independent directors, auditors, and regulators. For example, managers are less likely to cut R&D to reverse an earnings decline when institutional ownership is high (Bushee (1998)). Specifically, institutional ownership reduces the pressure on managers to engage in myopic investment behavior if institutional investors exhibit low turnover and momentum trading. Independent directors have sufficient technical knowledge to identify opportunistic reductions in R&D and to constrain myopic R&D spending efficiently (Osma (2008)). Similarly, auditors possess specialized training, industry expertise, and knowledge of state-of-the-art techniques to detect myopic R&D cuts (Balatbat (2006), Tutticci, Krishnan, and Percy (2007)). Regulators and auditors are able to increase the quality of R&D disclosures to render shortsighted managerial behavior more visible to the market (Tutticci et al. (2007)). In addition, other experts, such as financial analysts, are able to search for private information and are capable of judging whether R&D decreases are myopic (Chhaochharia and Grinstein (2007), Kimbrough (2007), and Gentry and Shen (2013)). Finally, managers themselves may initiate stock repurchases or accept compensation contingent on project outcomes, thereby sending credible signals to markets that their R&D decreases are not myopic (Meulbroek, Mitchell, Mulherin, Netter, and Poulsen (1990)). Therefore, our first hypothesis is as follows:

Hypothesis 1. All else being equal, when a firm announces earnings that meet targets by cutting R&D, the stock price reaction is negative.

This hypothesis involves the *average* unfavorable effect of managerial myopia on capital market reactions. Next, we explore whether negative market reactions are a function of investor sophistication.

Although investors who participate in stock markets are generally capable of searching for and analyzing information, investor sophistication varies across firms. The market responses to managerial myopia are dependent on investor sophistication, for several reasons. First, sophisticated individuals weigh cues more appropriately and can learn better from experience (Bonner, Walther, and Young (2003)). When managers forgo R&D projects solely for short-term purposes, sophisticated investors with the requisite knowledge and superior ability are likely to process that information more analytically and systematically, resulting in markets that are more aware of myopic managerial behavior. Second, sophisticated investors normally have better access to databases and analytical tools, meaning that it costs them less than others to engage in in-depth firm analysis (Bonner et al. (2003), Callen, Hope, and Segal (2005)). Third, institutional investors with large investment portfolios have more to gain or lose from their investment decisions. Therefore, they are more motivated to analyze specific R&D decrease decisions made by managers to determine whether such decisions are myopic. In contrast, less sophisticated investors may not have the same capabilities or resources to process all of the information embedded in financial statements. Hence, they are more likely to be misled by myopic managerial behavior.

The previous arguments suggest that sophisticated investors are more capable of seeing through myopic R&D behavior than unsophisticated investors. Therefore, myopic R&D cuts are more likely to be punished when investors are more sophisticated. We propose the second hypothesis as follows:

Hypothesis 2. Market reactions to myopic R&D cuts are more negative for firms with sophisticated investors.

III. Empirical Analysis

A. Sample and Measures

Our sample consists of firm-year observations from 1996 to 2017 drawn from the Compustat Database. We start our analysis in 1996 because EDGAR discloses limited filings data before that year, rendering it impossible to collect R&D expense information on earnings announcement dates before 1996.[10] All of the price and return data are taken from CRSP. To ensure that micro-cap or penny stocks do not bias our results, we drop firms with assets less than US$10 million or share prices less than US$1. Utilities and banks are also excluded from our sample, because their financial statements tend to differ from those of other types of firms. As mentioned previously, our sample consists only of firms with both the incentive and the ability to cut R&D to meet short-term earnings. Therefore, we only include firms for which earnings before R&D and taxes have declined relative to the previous year but by an amount that can be reversed by a 20%[11] reduction in R&D. Specifically, we compute earnings before tax and R&D (EBTRD) and exclude firms that do not satisfy the following inequation: "$-0.2 \times (\mathrm{R\&D}_{t-1}) \leq \mathrm{EBTRD}_t - \mathrm{EBTRD}_{t-1} < 0$." We also drop firms that cut R&D and fall short of their previous year's earnings.[12] We further delete observations if: i) Compustat reports missing values for sales, assets, book value of equity, or market value of equity or ii) data needed to compute

[10]We would like to thank the anonymous reviewer for the suggestion to confirm whether R&D information is available to investors on the earnings announcement dates and whether the R&D expenses disclosed on earnings announcement dates are the same as those disclosed on annual report/10 K announcement dates. For each observation, we first hand-collect the R&D expense amount released on the earnings announcement date and then compare it with the amount reported in the annual report released on the 10 K announcement date. We find that among our 2,581 observations from 1996 to 2017, 2,578 (99.88%) are firm-years for which R&D expense information is available on earnings announcement dates. Moreover, the amounts of R&D expenses released on earnings announcement dates are identical to the amounts shown on the annual reports announced after the earnings announcement dates. This procedure is important to ensure that the stock markets are aware of the correct R&D spending information on the earnings announcement dates.

[11]When the ratio of the distance from the earnings target to previous year R&D ($(\mathrm{EBTRD}_{t-1} - \mathrm{EBTRD}_t)/\mathrm{R\&D}_{t-1}$) is higher than 20%, the probability of R&D cuts is low (13.47%). This indicates that managers have difficulty cutting R&D to meet earnings targets if this ratio is high. To ensure that managers have both the incentive and ability to cut R&D to meet their previous year's earnings, we require the ratio to be less than or equal to 20%. We also use 10%, 15%, and 25% as the thresholds and obtain qualitatively similar results.

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

the variables are missing. Finally, we exclude 3 observations for which we cannot confirm whether R&D spending information is available on the earnings announcement dates.[13] The sample selection criteria yield 2,578 observations, with 825 myopic cutters and 1,753 non-cutters.[14] To mitigate the effects of outliers, we winsorize all of the variables except the dummy variables at the 1st and 99th percentiles.

We classify firms into two groups on the basis of whether they cut R&D and meet their previous year's earnings. We construct the dummy variable CUTRD, which is coded 1 if managers cut R&D in year t (i.e., R&D expenditure is lower than in the previous year) and earnings in year t are not lower than those in year $t-1$. CUTRD equals 0 if managers do not cut R&D in year t and fail to meet their previous year's earnings. Thus, CUTRD is our measure of managerial myopia.

Testing our hypotheses also requires measuring market reactions. To increase the robustness of our study, we use three measures to capture market reactions: raw returns (RAW_RET), market-adjusted abnormal returns (MKT_ADJ_RET), and size-adjusted abnormal returns (SIZE_ADJ_RET). These three types of returns are calculated using a 5-day window $[-2, +2]$ surrounding the earnings announcement dates.[15] Raw returns are daily returns from CRSP. Market-adjusted (size-adjusted) returns are calculated using daily CRSP returns adjusted by subtracting the cumulative market returns (market returns of firms in the same CRSP decile) over the same period.

B. Descriptive Statistics

Panel A of Table 1 provides descriptive statistics for myopic cutters and non-cutters. In terms of mean and median values, myopic cutters have significantly lower R&D change (ΔRD), firm size (SIZE), and non-GAAP disclosures (NONGAAP), as well as significantly higher earnings surprises (SURPRISE_ANLST and SURPRISE_LAG) and stock return momentum (MOMEMTUM). Myopic cutters and non-cutters show no significant differences regarding the information content of simultaneous filings submitted to the SEC (FILINGS), conference calls (CONFERENCE_CALL), bundled management forecasts (BDL_FORECAST), and other corporate events such as mergers and acquisitions (M&A), management turnover (TURNOVER), and name changes (NAME_CHANGE).

Panel B of Table 1 provides the distribution of observations for myopic cutters and non-cutters by industry (2-digit SIC codes). Most of the observations (approximately 84% of myopic cutters and 90% of non-cutters) cluster on five sectors: Chemical and Allied Products (SIC: 28), Industrial Machinery and Equipment (SIC: 35), Electronic and Other Electronic (SIC: 36), Instruments and Related Products (SIC: 38), and Business Service (SIC: 73).

[13] See footnote 10 for details.

[14] The sample selection process is presented in Appendix A.

[15] We also test 3-day stock returns, with similar (untabulated) results.

TABLE 1

Descriptive Statistics for Myopic Cutters and Non-Cutters

Panel A of Table 1 presents the summary statistics for the two subgroups: firms that cut R&D to meet their previous year's earnings (myopic cutters) and firms that do not cut R&D and fail to meet their previous year's earnings (non-cutters). The sample includes firm-years for which earnings before R&D and taxes have declined relative to the previous 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 provided. SURPRISE_ANLST is earnings surprises based on analyst forecasts. It is measured as the difference between actual earnings (as reported by IBES) and the most recent consensus analyst forecast (the median analyst forecast estimates as reported by IBES). $\triangle$RD is R&D in year *t* minus R&D in year $t-1$ scaled by assets. SIZE is the natural logarithm of the market value at the end of the fiscal year. *Q* is 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 the end of the fiscal year. MOMENTUM is market-adjusted returns over the previous 6 months. FILINGS is the natural logarithm of the total size of all filings submitted by a firm to the SEC within 2 days of the earnings announcement date. NONGAAP is the difference between non-GAAP earnings disclosed within 2 days of the earnings announcement date and actual earnings. CONFERENCE_CALL is a dummy variable that equals 1 if a firm has a conference call within 2 days of the earnings announcement date, and 0 otherwise. BDL_FORECAST is the difference between management's earnings forecasts disclosed within 2 days of the earnings announcement date and actual earnings. M&A is the natural logarithm of the total transaction value of mergers and/or acquisitions announced within 2 days of the earnings announcement date. TURNOVER is a dummy variable that equals 1 if a firm announces management turnover within 2 days of the earnings announcement date, and 0 otherwise. NAME_CHANGE is a dummy variable that equals 1 if a firm announces a name change within 2 days of the earnings announcement date, and 0 otherwise. SURPRISE_LAG is earnings surprise based on the previous year's earnings, measured as EARNINGS (earnings per share before extraordinary items in a given fiscal year) minus LAG_EARNINGS (earnings per share before extraordinary items in the previous fiscal year). All of the variables are defined in Appendix B. Panel B presents the distribution of observations for myopic cutters and non-cutters across industries labeled by 2-digit SIC codes. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively (2-tailed).

Panel A. Summary Statistics of Myopic Cutters and Non-Cutters

	Myopic Cutters (N = 825)			Non-Cutters (N = 1,753)			Difference	
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	*p*-Value	*p*-Value
Variable	1	2	3	4	5	6	1–4	2–5
SURPRISE_ANLST	0.106	0.040	0.297	−0.077	−0.010	0.269	<0.000***	<0.000***
$\triangle$RD	−0.062	−0.023	0.090	0.041	0.015	0.064	<0.000***	<0.000***
SIZE	5.790	5.309	2.095	6.173	5.915	1.976	<0.000***	<0.000***
Q	2.529	1.856	1.937	2.635	2.009	1.879	0.188	0.010**
MOMEMTUM	0.074	0.003	0.474	−0.005	−0.049	0.397	<0.000***	<0.000***
FILINGS	4.989	0.000	5.808	4.906	0.000	5.814	0.734	0.673
NONGAAP	0.018	0.000	0.016	0.041	0.000	0.238	0.039**	0.099*
CONFERENCE_CALL	0.173	0.000	0.379	0.176	0.000	0.381	0.838	0.855
BDL_FORECAST	0.002	0.000	0.050	−0.000	0.000	0.088	0.349	0.963
M&A	0.148	0.000	0.627	0.171	0.000	0.674	0.582	0.391
TURNOVER	0.002	0.000	0.049	0.003	0.000	0.053	0.505	0.846
NAME_CHANGE	0.159	0.000	0.366	0.154	0.000	0.361	0.757	0.756
SURPRISE_LAG	0.304	0.120	0.457	−0.282	−0.170	0.469	<0.000***	<0.000***

Panel B. Distribution of Observations by Industry

SIC	Industry	N (Myopic Cutters)	N (Non-Cutters)
1	Agricultural production	1	2
13	Oil and gas extraction	0	1
15	General building contractors	1	0
20	Food and kindred products	4	3
21	Tobacco products	2	2
22	Textile mill products	0	3
24	Lumber and wood products	1	0
25	Furniture and fixtures	1	6
26	Paper and allied products	6	9
27	Printing and publishing	1	2
28	Chemical and allied products	261	513
29	Petroleum and coal products	3	5
30	Rubber and misc. plastics products	6	6
31	Leather and leather products	0	1
32	Stone, clay, and glass products	3	3
33	Primary metal industries	0	1
34	Fabricated metal products	8	7
35	Industrial machinery and equipment	75	202
36	Electronic and other electronic equipment	122	295
37	Transportation equipment	31	51
38	Instruments and related products	117	245
39	Misc. manufacturing industries	7	16
45	Transportation by air	0	1
47	Transportation services	0	1
48	Communications	12	17

(continued on next page)

TABLE 1 (continued)
Descriptive Statistics for Myopic Cutters and Non-Cutters

Panel B. Distribution of Observations by Industry

SIC	Industry	*N* (Myopic Cutters)	*N* (Non-Cutters)
49	Electrics, gas, and sanitary services	0	2
50	Wholesale trade – durable goods	2	2
51	Wholesale trade – nondurable goods	2	2
58	Eating and drinking places	1	0
59	Miscellaneous retail	4	1
73	Business services	120	321
79	Amusement and recreation services	0	1
80	Health services	8	6
82	Educational services	0	1
87	Engineering and management services	15	17
99	Nonclassifiable establishments	11	8
	Total	825	1,753

C. Research Design

We first examine how investors react to myopic R&D behavior by comparing the abnormal returns of myopic cutters and non-cutters. Because myopic cutters have significantly higher earnings surprises than non-cutters (see Panel A of Table 1; p-values of the mean/median differences for SURPRISE_ANLST and SURPRISE_LAG are less than 0.000), we expect market reactions to myopic cutters to be more positive than those to non-cutters if markets are shortsighted and misled by managerial myopia. Conversely, if we find that market reactions to myopic cutters are more negative than those to non-cutters, this will indicate that investors punish myopic R&D cuts. Our research design thus provides a conservative way to detect the punishment of managerial myopia by investors.

To mitigate concerns that several other factors may affect abnormal returns, we apply the regression method to examine the influences of myopic R&D cuts on market reactions. First, we control for earnings surprises, an important determinant of abnormal returns. We measure earnings surprises (SURPRISE_ANLST) as the difference between actual earnings reported by IBES and the most recent consensus analyst forecast (i.e., the median of the most recent analyst forecast estimates).[16] Second, we follow the literature (e.g., DellaVigna and Pollet (2009), Larcker, Ormazabal, and Taylor (2011), and Huang, Nekrasov, and Teoh (2018)) and control for firm characteristics, such as R&D change (ΔRD), firm size (SIZE), Tobin's Q (Q), and stock return momentum (MOMENTUM). Third, we control for disclosures other than GAAP earnings during earnings announcements. Specifically, we control for the effects of simultaneous SEC filings by including filing size (FILINGS, measured as the natural logarithm of the total size of all of the filings submitted by a firm to the SEC within 2 days of the earnings announcement date). We also follow the literature (e.g., Heflin and Hsu (2008), Price, Doran, Peterson, and Bliss (2012), and Rogers and Van Buskirk (2013)) and control for non-GAAP earnings disclosures (NONGAAP), conference calls (CONFERENCE_CALL), and bundled management forecasts (BDL_FORECAST) during the earnings

[16]The results remain the same if we measure earnings surprises as the difference between current earnings and previous year earnings (SURPRISE_LAG).

announcement period. Fourth, studies suggest that events such as mergers and acquisitions (M&A), management turnover (TURNOVER), and company name changes (NAME_CHANGE) affect investors' reactions in stock markets (De Jong and Naumovska (2016)). Therefore, we further control for M&A, TURNOVER, and NAME_CHANGE in our model. Finally, we control for firm and year fixed effects to exclude the influences of unobservable, time-invariant firm and year-specific factors.[17] All of the variables are defined in Appendix B. Our regression model is as follows:

$$
\begin{aligned}
(1)\quad \mathrm{RETURN}_{i,t} = {} & \alpha_0 + \alpha_1 \mathrm{CUTRD}_{i,t} + \alpha_2 \mathrm{SURPRISE\_ANLST}_{i,t} + \alpha_3 \Delta \mathrm{RD}_{i,t} \\
& + \alpha_4 \mathrm{SIZE}_{i,t} + \alpha_5 Q_{i,t} + \alpha_6 \mathrm{MOMENTUM}_{i,t} \\
& + \alpha_7 \mathrm{FILINGS}_{i,t} + \alpha_8 \mathrm{NONGAAP}_{i,t} \\
& + \alpha_9 \mathrm{CONFERENCE\_CALL}_{i,t} + \alpha_{10} \mathrm{BDL\_FORECAST}_{i,t} \\
& + \alpha_{11} \mathrm{M\&A}_{i,t} + \alpha_{12} \mathrm{TURNOVER}_{i,t} + \alpha_{13} \mathrm{NAME\_CHANGE}_{i,t} \\
& + \text{Firm and Year Fixed Effects.} + \varepsilon
\end{aligned}
$$

D. Baseline Results

We report the empirical results of testing Hypothesis 1 in Table 2. Panel A presents the mean and median values of the 5-day returns surrounding the earnings announcement dates for myopic cutters and non-cutters. It shows that the mean and median values of RAW_RET, MKT_ADJ_RET, and SIZE_ADJ_RET are all significantly negative for myopic cutters. In contrast, for non-cutters, only the median values of size-adjusted returns are significantly negative. More importantly, column 5 in Panel A reveals significantly lower mean values for 5-day returns for myopic cutters (t-stat of −2.972, −2.564, and −2.741, respectively) than for non-cutters. The mean difference in 5-day returns between the two subgroups is approximately 1%, which is economically significant. Similarly, column 6 shows that the median values of 5-day returns are significantly lower for myopic cutters (z-statistics of −2.322, −2.153, and −1.900, respectively) than for non-cutters. Our results indicate that capital markets penalize managers' myopic behavior (e.g., cutting R&D to meet their previous year's earnings).

The multivariate regression results are shown in Panel B of Table 2, which presents the coefficients for equation (1). In all 3 columns, the coefficients on CUTRD are negative (−0.017, −0.015, and −0.014, respectively) and significant at the 1% level. The results show that myopic cutters have significantly lower abnormal returns than non-cutters, thus further supporting the notion that capital markets punish managerial myopia.

The results for the control variables are generally consistent with the literature. For example, the positive coefficients on SURPRISE_ANLST are consistent with previous studies on earnings response coefficients (e.g., Barth, Elliott, and Finn

[17]Although we endeavor to control for the main determinants of market reactions identified in the literature, we admit that similar to previous studies (e.g., Bhojraj et al. (2009), Price et al. (2012), Ho, Li, Tam, and Tong (2016), Chen, Chan, Dong, and Zhang (2017), Chen, Srinidhi, Su, and Tong (2018), Hu, Li, Taboada, and Zhang (2020), and Chen, Dong, Hu, and Zhang (2024)), we cannot fully address omitted variables and the related endogeneity problem.

TABLE 2

Market Reactions to Managerial Myopia

Panel A of Table 2 presents the 5-day returns surrounding the earnings announcement date for myopic cutters and non-cutters. Raw returns (RAW_RET) are calculated using daily CRSP returns. Market-adjusted (size-adjusted) abnormal returns (MKT_ADJ_RET (SIZE_ADJ_RET)) are calculated using daily CRSP returns and adjusted by subtracting the cumulative market returns (market returns of firms in the same CRSP decile) over the same period. Five-day (adjusted) returns are calculated as the (adjusted) cumulative returns within 2 days of the earnings announcement date. The *t*-statistics and *z*-statistics are presented in parentheses. Panel B presents the results of regressing 5-day returns surrounding the earnings announcements on myopic R&D cuts and the control variables. CUTRD is a dummy variable that equals 1 if a manager cuts R&D in year *t* (i.e., R&D expenditure is lower than in the previous year) and earnings in year *t* are not lower than those in year $t-1$, and 0 if a manager does not cut R&D in year *t* and fails to meet the previous year's earnings. All of the variables are defined in Appendix B. All of the variables except the dummy variables are winsorized at the 1st and 99th percentiles. Heteroscedasticity-robust and cluster-adjusted *t*-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively (2-tailed).

Panel A. Univariate Analysis

Measure of Returns	Myopic Cutters ($N = 825$)		Non-Cutters ($N = 1,753$)		Difference	
	Mean	Median	Mean	Median	*t*-Value	*z*-Value
	1	2	3	4	5 = 1–3	6 = 2–4
RAW_RET	−0.008**	−0.007***	0.005**	0.000	−0.013***	−0.007**
	(−2.114)	(−2.104)	(2.192)	(0.004)	(−2.972)	(−2.322)
MKT_ADJ_RET	−0.009**	−0.010***	0.002	−0.003	−0.011**	−0.007**
	(−2.428)	(−3.378)	(0.947)	(−1.536)	(−2.564)	(−2.153)
SIZE_ADJ_RET	−0.014***	−0.013***	−0.002	−0.006**	−0.011***	−0.007*
	(−3.831)	(−3.903)	(0.818)	(−2.801)	(−2.741)	(−1.900)

Panel B. Regression Results

Variable	RAW_RET	MKT_ADJ_RET	SIZE_ADJ_RET
	1	2	3
CUTRD	−0.017***	−0.015***	−0.014***
	(−3.996)	(−4.056)	(−3.853)
SURPRISE_ANLST	0.017**	0.018**	0.015*
	(2.049)	(2.204)	(1.670)
△RD	−0.021	−0.011	−0.014
	(−0.679)	(−0.375)	(−0.464)
SIZE	0.001	0.002**	0.002**
	(1.487)	(1.962)	(2.186)
Q	−0.003**	−0.003***	−0.003***
	(−2.454)	(−3.340)	(−3.267)
MOMENTUM	0.014**	0.014***	0.011**
	(2.175)	(2.643)	(2.293)
FILINGS	0.000	0.000	0.000
	(1.114)	(1.157)	(0.861)
NONGAAP	0.011**	0.010**	0.010*
	(2.215)	(2.061)	(1.917)
CONFERENCE_CALL	−0.010*	−0.009*	−0.009*
	(−1.938)	(−1.830)	(−1.775)
BDL_FORECAST	0.005	0.012**	0.016***
	(0.783)	(2.150)	(3.286)
M&A	0.008**	0.006*	0.006*
	(2.119)	(1.675)	(1.656)
TURNOVER	−0.007	0.006	−0.000
	(−0.181)	(0.150)	(−0.010)
NAME_CHANGE	0.003	0.004	0.004
	(0.592)	(0.750)	(0.835)
CONSTANT	0.010*	0.003	0.004
	(1.940)	(0.648)	(0.609)
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
No. of obs.	2,578	2,578	2,578
Adj. R^2	0.021	0.019	0.018

(1999), Ghosh, Gu, and Jain (2005), and Collins, Li, and Xie (2009)). Furthermore, the positive coefficients on SIZE and the negative coefficients on Q are consistent with the results of Larcker et al. (2011).

E. Effects of Investor Sophistication on Market Reactions to Managerial Myopia

Investor sophistication is not homogeneous in capital markets. If a firm's investors are unsophisticated, they are less likely to perceive managers' myopic behavior. Following prior studies (e.g., Bartov, Radhakrishnan, and Krinsky (2000), Callen et al. (2005), and Chan, Zhang, and Zhang (2013)), we use the percentage of shares held by institutions[18] (INST_PERCENT) as a proxy for investor sophistication. Institutional investors are banks, insurance companies, and investment companies, including their managers, independent advisors, and others. Given that quasi-indexing institutions are passive investors (Chan et al. (2013)), we only consider the shares held by non-quasi-indexing institutions.[19] Institutional holding data are derived from 13-F filings to the SEC, provided by the CDA Spectrum database. We obtain institutional investor classification data (Bushee and Noe (2000), Bushee (2001)) from https://accounting-faculty.wharton.upenn.edu/bushee/.[20] Our sample for testing Hypothesis 2 consists of 1,980 firm-year observations covering the period from 1996 to 2017.

We conduct subsample regression analyses to examine the effects of investor sophistication on market reactions to managerial myopia. Specifically, we divide our sample into high-IS and low-IS subsamples. The high-IS (low-IS) subsample consists of firm-years for which INST_PERCENT is higher (lower) than the median in year t, thus representing more (less) sophisticated investors. We expect the results of estimating equation (1) to be stronger in the high-IS sample. Because a precise threshold for the level of investor sophistication that ensures their ability to perceive myopic managerial behavior is unknown, we make no prediction as to the results of the low-IS subsample.

We present the subsample regression results in Table 3, which shows that the coefficients on CUTRD are all significantly negative in the high-IS subsample (t-stat of −3.198, −2.665, and −2.699, respectively) but not significant in the low-IS subsample (t-stat of −0.583, −0.577, and −0.262, respectively). The differences in coefficients are statistically significant (at the 10% level or better), suggesting that the negative effect of myopic behavior on stock returns is more pronounced when investors are more sophisticated. Our second hypothesis is thus supported.

[18]Following Jiang, Xu, and Yao (2009), we use institutional ownership orthogonal to short-sale constraints, active mutual fund ownership, and analyst coverage as alternative measures of investor sophistication. Our results (untabulated) remain qualitatively unchanged.

[19]We thank the anonymous reviewer for the suggestion of excluding quasi-indexing institutions. Our results remain unchanged if we include quasi-indexing institutions or consider only dedicated institutions when calculating institutional holdings.

[20]We thank Professor Brian Bushee for generously sharing these data with us.

TABLE 3

Investor Sophistication and Market Reactions to Managerial Myopia

Table 3 presents the results of the investor sophistication test. The dependent variables are RAW_RET, MKT_ADJ_RET, and SIZE_ADJ_RET, in columns 1–3, respectively. We divide the full sample into the High-IS subsample (firms with high investor sophistication) and the Low-IS subsample (firms with low investor sophistication). A firm is classified as High-IS (Low-IS) if its INST_PERCENT is higher (lower) than the sample median. INST_PERCENT is the percentage of ownership by non-quasi-indexing institutional investors. All of the variables are defined in Appendix B. All of the variables except the dummy variables are winsorized at the 1st and 99th percentiles. Heteroscedasticity-robust and cluster-adjusted *t*-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively (2-tailed).

	RAW_RET		MKT_ADJ_RET		SIZE_ADJ_RET	
	High-IS	Low-IS	High-IS	Low-IS	High-IS	Low-IS
	1		2		3	
CUTRD	−0.019***	−0.004	−0.018***	−0.004	−0.018***	−0.002
	(−3.198)	(−0.583)	(−2.665)	(−0.577)	(−2.699)	(−0.262)
SURPRISE_ANLST	0.062***	0.032**	0.060***	0.035**	0.058***	0.030**
	(3.979)	(2.123)	(3.920)	(2.293)	(3.663)	(1.982)
△RD	0.017	−0.023	0.007	−0.015	−0.007	−0.020
	(0.372)	(−0.449)	(0.142)	(−0.337)	(−0.140)	(−0.478)
SIZE	0.001	−0.001	0.001	−0.000	0.002	0.000
	(0.572)	(−0.816)	(0.603)	(−0.382)	(0.878)	(0.107)
Q	−0.002	0.001	−0.002	0.000	−0.002	0.000
	(−1.381)	(0.493)	(−1.512)	(0.231)	(−1.415)	(0.089)
MOMENTUM	0.009	0.012	0.008	0.011	0.005	0.007
	(0.851)	(1.253)	(0.818)	(1.139)	(0.499)	(0.766)
FILINGS	0.001*	0.000	0.001*	0.000	0.001*	0.000
	(1.709)	(0.661)	(1.670)	(0.937)	(1.896)	(0.463)
NONGAAP	0.006	0.051**	0.005	0.050***	0.005	0.048***
	(0.857)	(2.368)	(0.607)	(3.136)	(0.585)	(3.249)
CONFERENCE_CALL	0.004	−0.036***	0.003	−0.034***	0.003	−0.033***
	(0.734)	(−4.018)	(0.480)	(−4.641)	(0.522)	(−4.301)
BDL_FORECAST	0.007	−0.035	0.014**	−0.024	0.017***	−0.006
	(1.353)	(−0.700)	(2.424)	(−0.340)	(3.145)	(−0.094)
M&A	0.003	−0.003	0.002	−0.003	0.002	−0.004*
	(1.614)	(−1.047)	(1.116)	(−1.467)	(1.261)	(−1.798)
TURNOVER	−0.066***	−0.026	−0.056***	−0.000	−0.049***	−0.011
	(−3.654)	(−1.044)	(−3.420)	(−0.011)	(−4.970)	(−0.361)
NAME_CHANGE	0.017**	−0.011	0.017***	−0.011	0.017**	−0.009
	(2.364)	(−1.328)	(2.675)	(−1.206)	(2.560)	(−0.944)
CONSTANT	0.075	0.086***	0.054	0.094***	0.039	0.055***
	(1.391)	(7.618)	(1.034)	(7.470)	(0.798)	(4.941)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	990	990	990	990	990	990
Adj. R^2	0.062	0.021	0.056	0.017	0.052	0.019
Coefficient difference for CUTRD	$p = 0.018$**		$p = 0.052$*		$p = 0.047$**	

IV. Additional Tests

A. Alternative Methods of Identifying Myopic Cutters

This study uses a sample of firms with small decreases in EBTRD (i.e., a "small decrease" sample) to identify myopic cutters. Although using the "small decrease" sample lowers the probability of misidentifying myopic cutters, some firms cutting R&D to stop negative NPV projects may still be misclassified as myopic cutters. To mitigate this concern, we apply two alternative approaches to identifying myopic cutters, thereby increasing the robustness of our results. First, we further require our myopic cutters in the main tests to barely meet or beat their

previous year's earnings. Specifically, myopic cutters must have earnings increases of no more than US$0.01 (columns 1–3 in Panel A of Table 4), US$0.02 (columns 4–6 in Panel A of Table 4), or US$0.03 (columns 7–9 in Panel A of Table 4). Given that these firms cut R&D to report positive earnings but only barely meet or beat their previous year's earnings, they are more likely to cut R&D for myopic reasons than to stop negative NPV projects. The results reported in Panel A of Table 4 show that the coefficients on CUTRD are significantly negative in all 9 columns, thus indicating that our results are robust to this alternative method of identifying myopic cutters.

Second, we follow Degeorge, Patel, and Zeckhauser (1999) and focus on two types of firms: i) firms that barely meet or beat their previous year's earnings by cutting R&D and ii) firms that exceed their previous year's earnings by a significant amount.[21] Specifically, we define the first type of firm as R&D-decreasing firms whose EBTRD is lower than the previous year but whose earnings are higher than the previous year by no more than US$0.04. That is, this group of firms satisfies the following inequations: $R\&D_t < R\&D_{t-1}$, $EBTRD_t < EBTRD_{t-1}$, and $0 < EARNINGS_t - EARNINGS_{t-1} \leq 0.04$. The second group includes R&D-decreasing firms whose EBTRD is higher than the previous year and whose earnings are higher than the previous year by more than US$0.10 but no more than US$0.14 (columns 1–3 in Panel B of Table 4), more than US$0.15 but no more than US$0.19 (columns 4–6 in Panel B of Table 4), or more than US$0.20 but no more than US$0.25 (columns 7–9 in Panel B of Table 4). The inequations used to define this group of firms are $R\&D_t < R\&D_{t-1}$, $EBTRD_t > EBTRD_{t-1}$, and $0.1 < EARNINGS_t - EARNINGS_{t-1} \leq 0.14$ (or $0.15 < EARNINGS_t - EARNINGS_{t-1} \leq 0.19$, or $0.2 < EARNINGS_t - EARNINGS_{t-1} \leq 0.25$). As such, the firms in the first group are more likely to be myopic cutters than those in the second group. Therefore, MYO_CUTTER takes a value of 1 if a firm belongs to the first type, and 0 otherwise. We use this sample to re-estimate the baseline regression and report the results in Panel B of Table 4. In the interest of brevity, we do not report the coefficients on the control variables. As shown, the coefficients on MYO_CUTTER are significantly negative in all 9 columns, indicating that capital markets punish managerial myopia. In summary, our results remain unchanged when we use alternative methods of identifying myopic cutters.

B. The Role of Overinvestment

Agency theory suggests that managers do not always invest in R&D to maximize firm value (Jensen and Meckling (1976)). Instead, managers may make R&D investments for empire-building purposes, thus leading to overinvestment (Jensen (1986), Biddle and Hilary (2006)). If a firm is suspected of overinvesting, myopically cutting R&D may not be punished by investors, as a lower level of R&D investment in such firms is arguably closer to the optimal level. In contrast, if a firm is regarded as a value maximizer or under-investor, then myopically cutting R&D

[21] We thank the anonymous reviewer for suggesting this alternative approach to identifying myopic cutters.

TABLE 4

Alternative Measures of Managerial Myopia

Table 4 presents the results of applying alternative methods to identify myopic cutters. In Panel A, we further limit myopic cutters to firms that barely meet/beat their previous year's earnings by cutting R&D. Specifically, we further require myopic cutters to have earnings higher than in the previous year by less than US$0.01 (columns 1–3), less than US$0.02 (columns 4–6), and less than US$0.03 (columns 7–9). In Panel B, we follow Degeorge et al. (1999) and distinguish between firms that barely meet or exceed their previous year's earnings by cutting R&D and firms that strongly exceed their previous year's earnings. Specifically, we follow Degeorge et al. (1999) and identify myopic cutters as R&D-decreasing firms with EBTRD lower than the previous year but earnings higher than the previous year by no more than US$0.04. Non-myopic cutters are defined as R&D-decreasing firms with EBTRD higher than in the previous year and earnings higher than in the previous year by more than US$0.10 but no more than US$0.14 (columns 1–3 in Panel B), more than US$0.15 but no more than US$0.19 (columns 4–6 in Panel B), or more than US$0.20 but no more than US$0.25 (columns 7–9 in Panel B). MYO_CUTTER is a dummy variable that equals 1 if a firm is classified as a myopic cutter, and 0 otherwise. All of the variables are defined in Appendix B. We winsorize all of the variables except the dummy variables at the 1st and 99th percentiles. Heteroscedasticity-robust and cluster-adjusted *t*-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively (2-tailed).

Panel A. Further Limiting Myopic Cutters to Firms that Barely Meet/Beat Their Earnings Targets

	Myopic Cutters that Beat Their Earnings Targets by Less Than US$0.01			Myopic Cutters that Beat Their Earnings Targets by Less Than US$0.02			Myopic Cutters that Beat Their Earnings Targets by Less Than US$0.03		
	RAW_RET	MKT_ADJ_RET	SIZE_ADJ_RET	RAW_RET	MKT_ADJ_RET	SIZE_ADJ_RET	RAW_RET	MKT_ADJ_RET	SIZE_ADJ_RET
Variable	1	2	3	4	5	6	7	8	9
CUTRD	−0.023**	−0.022**	−0.022**	−0.027***	−0.027**	−0.026**	−0.016***	−0.015**	−0.015**
	(−2.397)	(−2.250)	(−2.124)	(−2.588)	(−2.533)	(−2.477)	(−2.660)	(−2.352)	(−2.159)
CONSTANT	0.022***	0.017**	0.019**	0.020***	0.016**	0.017**	0.021***	0.017**	0.018**
	(2.891)	(2.292)	(2.356)	(2.874)	(2.222)	(2.304)	(2.982)	(2.464)	(2.469)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	1,828	1,828	1,828	1,874	1,874	1,874	1,915	1,915	1,915
Adj. R^2	0.022	0.024	0.021	0.022	0.024	0.024	0.020	0.022	0.020

Panel B. Identifying Myopic Cutters Following Degeorge et al. (1999)

	Myopic Cutters that Beat Their Earnings Targets by Less Than US$0.04 vs. Non-Myopic Cutters that Beat Earnings Targets by US$0.10–US$0.14			Myopic Cutters that Beat Their Earnings Targets by Less Than US $0.04 vs. Non-Myopic Cutters that Beat Earnings Targets by US$0.15–US$0.19			Myopic Cutters that Beat Their Earnings Targets by Less Than US$0.04 vs. Non-Myopic Cutters that Beat Earnings Targets by US$0.20–US$0.24		
	RAW_RET	MKT_ADJ_RET	SIZE_ADJ_RET	RAW_RET	MKT_ADJ_RET	SIZE_ADJ_RET	RAW_RET	MKT_ADJ_RET	SIZE_ADJ_RET
Variable	1	2	3	4	5	6	7	8	9
MYO_CUTTER	−0.025**	−0.027**	−0.025**	−0.033**	−0.031**	−0.032***	−0.020*	−0.023**	−0.023**
	(−2.209)	(−2.295)	(−2.101)	(−2.488)	(−2.385)	(−2.632)	(−1.954)	(−2.357)	(−2.332)
CONSTANT	−0.030*	−0.019	−0.027*	0.026**	0.020*	0.030**	−0.041**	−0.025	−0.026
	(−1.650)	(−1.333)	(−1.802)	(2.027)	(1.674)	(2.387)	(−2.046)	(−1.224)	(−1.210)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	343	343	343	375	375	375	334	334	334
Adj. R^2	0.020	0.020	0.024	0.025	0.022	0.029	0.036	0.034	0.038

could raise serious concerns about the firm's long-term performance, leading to more negative market reactions. Hence, we expect market reactions to myopic R&D cuts to be less negative for firms with overinvestment problems.

We follow prior studies (e.g., Lang and Litzenberger (1989), Denis, Denis, and Sarin (1994)) and use Tobin's Q (i.e., Q) to determine whether a firm overinvests. Specifically, if a firm's Tobin's Q is not greater than 1, we define it as an over-investor. To this end, we construct the dummy variable OVERINV that equals 1 for firms with Q not greater than 1, and 0 otherwise. We then conduct the following regression analysis to examine the effects of overinvestment on market reactions to managerial myopia:

$$\begin{aligned}(2)\quad \text{RETURN}_{i,t} = {} & \beta_0 + \beta_1 \text{CUTRD}_{i,t} + \beta_2 \text{OVERINV}_{i,t} + \beta_3 \text{CUTRD}_{i,t} \\ & \times \text{OVERINV}_{i,t} + \beta_4 \text{SURPRISE\_ANLST}_{i,t} + \beta_5 \Delta\text{RD}_{i,t} \\ & + \beta_6 \text{SIZE}_{i,t} + \beta_7 \text{Q}_{i,t} + \beta_8 \text{MOMENTUM}_{i,t} + \beta_9 \text{FILINGS}_{i,t} \\ & + \beta_{10} \text{NONGAAP}_{i,t} + \beta_{11} \text{CONFERENCE\_CALL}_{i,t} \\ & + \beta_{12} \text{BDL\_FORECAST}_{i,t} + \beta_{13} \text{M\&A}_{i,t} + \beta_{14} \text{TURNOVER}_{i,t} \\ & + \beta_{15} \text{NAME\_CHANGE}_{i,t} + \text{Firm and Year Fixed Effects} + \varepsilon.\end{aligned}$$

We predict β_3 to be significantly positive, because market reactions to myopic R&D cuts are expected to be less negative for over-investors.

The regression results are presented in Table 5. The coefficients on CUTRD are all significantly negative (t-stat of −3.952, −3.788, and −3.263, respectively), consistent with our main results. More importantly, β_3, the coefficients on the interaction term CUTRD × OVERINV, are all significantly positive (t-stat of 2.455, 2.163, and 2.229, respectively), indicating that investors' negative reactions to myopic R&D cuts are less pronounced for over-investors. In summary, our results suggest that market reactions to myopic R&D cuts are less negative for overinvesting firms.

C. Managerial Incentive to Behave Myopically

The previous findings suggest that markets are efficient and thus do not pressure managers to cut R&D myopically. However, what causes managers to act myopically remains to be determined. Studies document that the incentives embedded in executive compensation packages shape managerial decisions and behavior (Coles, Daniel, and Naveen (2006), O'Connor et al. (2013), and Chen, Tang, and Zhang (2020)). For example, because a firm that misses its earnings benchmarks may signal poor performance, thereby inducing its compensation committee to penalize managers, earnings-based performance measures should prompt these managers to manipulate earnings, leading to an overemphasis on short-term goals or myopic management of resources (Matsunaga and Park (2001)). Although firms may design equity-based compensation to align the interests of managers with those of shareholders, earnings are still the most frequently used performance metrics, according to a survey conducted by Towers Watson (Murphy and Jensen (2011)). Almost all companies effectively rely on some measure of accounting profit, such as net income, pre-tax income, or operating profit in their annual CEO bonus plans. Furthermore, although bonuses are

TABLE 5

Overinvestment and Market Reactions to Managerial Myopia

Table 5 presents the effect of overinvestment on market reactions on managerial myopia. The dependent variables are RAW_RET, MKT_ADJ_RET, and SIZE_ADJ_RET, in columns 1–3, respectively. OVERINV is a dummy variable that equals 1 if a firm's Tobin's *Q* is not greater than 1, and 0 otherwise. All of the other variables are defined in Appendix B. All of the variables except the dummy variables are winsorized at the 1st and 99th percentiles. Heteroscedasticity-robust and cluster-adjusted *t*-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively (2-tailed).

	RAW_RET	MKT_ADJ_RET	SIZE_ADJ_RET
Variable	1	2	3
CUTRD	−0.019***	−0.016***	−0.013***
	(−3.952)	(−3.788)	(−3.263)
OVERINV	0.003	0.002	0.005
	(0.368)	(0.284)	(0.493)
CUTRD × OVERINV	0.024**	0.019**	0.027**
	(2.455)	(2.163)	(2.229)
SURPRISE_ANLST	0.018**	0.018**	0.016*
	(2.227)	(2.338)	(1.818)
△RD	−0.036	−0.020	−0.013
	(−1.343)	(−0.750)	(−0.466)
SIZE	0.002*	0.003**	0.003***
	(1.909)	(2.560)	(2.586)
Q	−0.001	−0.002*	−0.001
	(−1.081)	(−1.908)	(−1.435)
MOMENTUM	0.016***	0.017***	0.014***
	(2.696)	(3.289)	(3.176)
FILINGS	0.000	0.000	0.000
	(1.192)	(1.132)	(0.906)
NONGAAP	0.012**	0.010**	0.010*
	(2.356)	(2.119)	(1.918)
CONFERENCE_CALL	−0.008*	−0.006	−0.007
	(−1.854)	(−1.462)	(−1.592)
BDL_FORECAST	0.008**	0.006	0.007*
	(1.964)	(1.493)	(1.673)
M&A	−0.003	0.010	0.004
	(−0.083)	(0.282)	(0.122)
TURNOVER	0.005	0.006	0.007
	(1.017)	(1.168)	(1.235)
NAME_CHANGE	0.053***	0.044*	0.017
	(3.040)	(1.778)	(1.352)
CONSTANT	0.010*	0.003	0.004
	(1.940)	(0.648)	(0.609)
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
No. of obs.	2,578	2,578	2,578
Adj. R^2	0.021	0.019	0.016

relatively small compared with equity-based compensation, bonus plans are at least as important and effective as equity-based schemes in terms of rewarding and directing managerial decisions, for two reasons. First, it is easier to implement bonus plans than equity-based schemes. Second, immediate cash rewards provide stronger incentives than the relatively distant and uncertain paper gains involved in equity plans (Murphy and Jensen (2011)). However, as mentioned previously, such accounting profit-based bonus plans invariably lead to myopic R&D spending. By meeting earnings targets, managers can increase their personal wealth in the form of earnings-based compensation. Hence, we propose that compensation is a potential

cause of managerial myopia[22] and expect that myopic cutters receive higher compensation, especially earnings-based compensation, than non-cutters.

Following the previous arguments, we examine whether managerial myopia affects CEO compensation, including total pay, earnings-based pay, and non-earnings-based pay. Total pay (TOTAL_PAY) is the sum of earnings-based pay and non-earnings-based pay and is thus a comprehensive measure of CEO compensation. Earnings-based pay (EARNINGS_PAY) is the bonus earned by a CEO during the fiscal year and is assumed to be based on accounting information, such as earnings (Holthausen, Larcker, and Sloan (1995), Guidry, Leone, and Rock (1999), Healy (1999), and Duru, Mansi, and Reeb (2005)).[23] Non-earnings-based pay (NONEARNINGS_PAY) includes salary, 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 the Black–Scholes 1973 model adjusted for dividends.

We test our prediction by estimating the following model:

$$\begin{aligned}(3)\quad \Delta PAY_{i,t} = {} & \mu_0 + \mu_1 CUTRD_{i,t} + \mu_2 \Delta ROA_{i,t} + \mu_3 RET_{i,t} + \mu_4 \Delta RD_{i,t} + \mu_5 SIZE_{i,t-1} \\ & + \mu_6 Q_{i,t-1} + \mu_7 LEV_{i,t-1} + \mu_8 OWNERSHIP_{i,t-1} + \mu_9 TENURE_{i,t} \\ & + \mu_{10} EINDEX_{i,t-1} + \mu_{11} BOARD\_SIZE_{i,t-1} + \mu_{12} BOARD\_IND_{i,t-1} \\ & + \mu_{13} CEO\_DUALITY_{i,t-1} + \text{Firm and Year Fixed Effects} + \varepsilon.\end{aligned}$$

The model and control variables in equation (3) are based on previous studies (Sloan (1993), Cheng (2004), and Cheng and Indjejikian (2009)). We control for ΔROA (i.e., the change in return on assets) and annual stock returns, as accounting and stock performance measures positively affect CEO compensation (Lambert and Larcker (1987), Baber, Janakiraman, and Kang (1996)). We also control for other variables identified by previous studies as determinants of CEO compensation (Murphy (1999), Hartzell and Starks (2003), and Cheng and Indjejikian (2009)). These variables include firm-level characteristics (ΔROA, SIZE, Q, and LEV), CEO characteristics (equity ownership and CEO tenure), and corporate governance variables (board size, board independence, CEO duality, and an index of anti-takeover provisions). All of the variables are defined in Appendix B.

Theoretically, cutting R&D increases net income. However, whether increased net income leads to higher CEO compensation depends on how the relevant compensation contracts are designed. If CEO compensation contracts (or part of the contracts) encourage managers to boost bottom-line figures and do not differentiate between various causes of increased net income, then R&D cuts lead to higher CEO compensation. If, however, CEO compensation contracts are designed to discourage managers from achieving higher earnings through myopic behavior, we expect net income increased by myopic R&D cuts to lead to lower CEO compensation.

[22] We do not suggest that boards of directors are myopic or support managerial myopia. Rather, it is common for unpredictable contingencies to emerge that cannot be factored into compensation contracts. The incompleteness of such contracts, therefore, can contribute to managers' myopic behavior.

[23] We thank the anonymous reviewer for the suggestion of using earnings-based compensation as an alternative measure of CEO compensation.

As illustrated previously, our research design aims to compare myopic cutters with non-cutters. According to our construction, myopic cutters are those who present increased earnings by cutting their R&D investment levels, while non-cutters are those who would be able to present increased earnings by cutting R&D investment but nevertheless choose not to. Myopic cutters report higher earnings surprises than non-cutters because they engage in myopic behavior. Therefore, if a compensation contract is long-term oriented, it should factor in the reasons for any increase in income obtained by myopic cutters. Specifically, to the extent that cutting R&D is unfavorable for long-term performance, an efficient compensation contract should not compensate CEOs for achieving increased earnings through R&D spending cuts. If a firm's compensation contract encourages managers to pursue short-term performance goals (e.g., earnings-based compensation), however, this results in higher compensation for myopic cutters than for non-cutters. These arguments suggest that a significantly positive μ_1 indicates that CEOs are compensated for the increased earnings generated by cutting R&D, whereas a significantly negative μ_1 indicates that CEOs receive lower pay because of the myopic R&D cuts they make to boost earnings.

We test our prediction on a sample of 375 firm-year observations in which managers have both the incentive and ability to cut R&D to meet their previous year's earnings. We obtain the annual compensation information from ExecuComp. Because we analyze the change in compensation, we require a firm to have 2 consecutive years of available compensation data. For this reason, we also restrict our sample to firms involving executives who have been CEOs for 2 consecutive years. The other sample selection criteria are the same as those mentioned previously.

The results are shown in Table 6. Columns 1–3 report the results for total pay, earnings-based pay, and non-earnings-based pay, respectively. In columns 1 and 2, the coefficients on CUTRD are positive and significant (t-stat of 1.994 and 2.541, respectively), indicating that managers generally receive higher pay, especially earnings-based pay, by acting myopically. In column 3, the coefficient on CUTRD is not significant (t-stat of -1.448). Overall, our results show that myopic cutters can receive higher earnings-based compensation than non-cutters, indicating that their compensation contracts are designed in such a way that managers are compensated if they manage to boost earnings, even if the increased earnings are achieved by cutting long-term R&D projects. Therefore, the promise of higher compensation, especially earnings-based compensation, may induce managers to opt to behave myopically.

D. Managerial Myopia and Future Performance

Managers' myopic behavior is expected to harm firm performance in the long run. Therefore, we further test whether myopic cutters experience lower future performance than non-cutters. To this end, we estimate a regression model in which the dependent variable is future performance and the independent variables are CUTRD, SURPRISE_ANLST, ΔRD, SIZE, Q, MOMENTUM, DACC, and RM. The dependent variable of future performance is captured by either stock

TABLE 6

CEO Compensation and Managerial Myopia

Table 6 presents the results of the CEO compensation test. The dependent variables for columns 1–3 are the change in a CEO's total pay, earnings-based pay, and non-earnings-based pay, respectively. All of the variables are defined in Appendix B. All of the variables except the dummy variables are winsorized at the 1st and 99th percentiles. Heteroscedasticity-robust and cluster-adjusted *t*-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively (2-tailed).

Variable	△TOTAL_PAY 1	△EARNINGS_PAY 2	△NONEARNINGS_PAY 3
CUTRD	0.140** (1.994)	0.661** (2.541)	−0.149 (−1.448)
△ROA	−1.159 (−1.294)	−2.489 (−0.508)	−1.356 (−1.139)
RET	0.973*** (3.456)	−0.989 (−1.251)	0.881** (2.569)
△RD	0.220** (2.557)	0.242 (0.568)	0.290*** (3.052)
SIZE	0.039* (1.932)	0.140 (1.115)	0.052* (1.836)
Q	−0.047* (−1.676)	0.031 (0.344)	−0.057* (−1.888)
LEV	0.044 (0.209)	−0.452 (−0.334)	0.027 (0.061)
OWNERSHIP	0.250 (0.311)	7.227*** (2.950)	−1.086 (−1.186)
TENURE	0.008** (2.051)	0.003 (0.122)	0.017*** (3.633)
EINDEX	−0.111 (−0.699)	0.472 (0.963)	−0.218 (−1.126)
BOARD_SIZE	0.609** (2.110)	2.017** (2.581)	0.745** (2.156)
BOARD_IND	−0.053 (−1.050)	−0.479** (−2.299)	−0.084 (−1.618)
CEO_DUALITY	−0.027 (−0.884)	0.029 (0.332)	−0.073** (−2.246)
CONSTANT	−1.579*** (−3.897)	−7.465*** (−8.640)	−1.473*** (−2.911)
Firm fixed effects Year fixed effects	Yes Yes	Yes Yes	Yes Yes
No. of obs. Adj. R^2	375 0.227	375 0.162	375 0.192

market performance (RET, the 1-year stock returns from the earnings announcement date) or financial performance (ROA and ROE). DACC is accrual earnings management, which is calculated as the absolute value of discretionary accruals using the modified Jones model. RM is real earnings management, which is calculated as the sum of the three standardized real earnings management proxies computed by following Roychowdhury (2006). The other variables are defined as previously.

The results are shown in Table 7. In Panel A, future performance is measured by RET_{t+1}, ROA_{t+1}, or ROE_{t+1}. In all 3 columns, the coefficients on CUTRD are significantly negative (−0.077, −0.040, and −0.040, respectively, all significant at the 5% level), indicating that myopic cutters experience lower future performance than non-cutters. We then repeat the regression using the mean values of future

TABLE 7

Managerial Myopia and Future Performance

Table 7 presents the results of regressing future performance on myopic R&D cuts and the control variables. In Panel A, future performance is measured as the 1-year stock returns from the earnings announcement date (RET_{t+1}), return on assets at the end of the following fiscal year (ROA_{t+1}), or return on equity at the end of the following fiscal year (ROE_{t+1}). In Panel B, future performance is measured as the mean value of future stock return, future return on assets, or future return on equity calculated on the basis of 3 annual observations, from years $t+1$ to $t+3$. All of the variables are defined in Appendix B. All of the variables except the dummy variables are winsorized at the 1st and 99th percentiles. Heteroscedasticity-robust and cluster-adjusted *t*-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively (2-tailed).

Panel A. Performance in the Following Year

Variable	RET_{t+1} 1	ROA_{t+1} 2	ROE_{t+1} 3
CUTRD	−0.077***	−0.040***	−0.040**
	(−2.605)	(−3.459)	(−2.467)
SURPRISE_ANLST	0.098***	0.013	0.084**
	(3.278)	(0.565)	(2.269)
△RD	0.319**	−0.091	0.148
	(2.524)	(−1.126)	(0.777)
SIZE	−0.007	0.051***	0.066***
	(−1.018)	(16.695)	(14.645)
Q	−0.028***	−0.029***	−0.023***
	(−3.500)	(−6.311)	(−3.342)
MOMENTUM	0.201***	0.067***	0.108***
	(4.248)	(3.073)	(3.289)
DACC	−0.224*	−0.054	−0.206*
	(−1.792)	(−0.780)	(−1.907)
RM	−0.009	−0.025***	−0.021***
	(−0.614)	(−3.413)	(−2.849)
CONSTANT	0.086	−0.070*	−0.139**
	(0.485)	(−1.875)	(−2.100)
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
No. of obs.	2,578	2,578	2,578
Adj. R^2	0.129	0.331	0.241

Panel B. Average Performance of the Following 3 years

Variable	$(RET_{t+1} + RET_{t+2} + RET_{t+3})/3$ 1	$(ROA_{t+1} + ROA_{t+2} + ROA_{t+3})/3$ 2	$(ROE_{t+1} + ROE_{t+2} + ROE_{t+3})/3$ 3
CUTRD	−0.035***	−0.042***	−0.055***
	(−2.780)	(−3.988)	(−2.629)
SURPRISE_ANLST	0.053***	0.009	0.037
	(3.057)	(0.544)	(1.401)
△RD	−0.005	0.162	−0.264
	(−0.041)	(1.186)	(−0.788)
SIZE	−0.001	0.037***	0.064***
	(−0.343)	(9.176)	(8.803)
Q	−0.032***	−0.039***	−0.053***
	(−9.526)	(−7.687)	(−7.162)
MOMENTUM	0.053**	0.004	0.027
	(2.072)	(0.197)	(0.662)
DACC	0.005	−0.083***	−0.153***
	(0.588)	(−6.676)	(−7.910)
RM	−0.000***	−0.000***	−0.000***
	(−2.908)	(−3.967)	(−3.244)
CONSTANT	0.360***	−0.061	−0.051
	(4.429)	(−0.564)	(−0.323)
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
No. of obs.	2,578	2,578	2,578
Adj. R^2	0.122	0.433	0.317

performance calculated on the basis of 3 annual observations, from years $t + 1$ to $t + 3$. The results, shown in Panel B, remain unchanged. Our results further support the premise that cutting R&D for short-term earnings targets is unfavorable for firms' future performance.

V. Concluding Remarks

Many academics and practitioners believe that myopia is a critical problem faced by modern firms (Edmans (2009)) and that concerns about stock prices drive managerial myopia. Therefore, using R&D cuts made to meet short-term earnings targets as a setting, we examine whether markets punish managerial myopia.

The study is based on a sample of U.S. firms with lower pre-tax and pre-R&D earnings relative to the previous year, where earnings have declined by an amount that can be reversed by cutting 20% of the previous year's R&D. We investigate whether markets react negatively to managerial myopia around the earnings announcement date. Using 5-day returns surrounding the announcements of earnings as an indicator of market reactions, we find that myopic cutters experience significantly lower market returns, although they manage to report increased earnings in their financial statements. The findings suggest that markets are not myopic, in that they indeed penalize firms whose managers engage in myopic R&D cutting to achieve short-term goals. Our further tests indicate that negative market reactions to managerial myopia only exist for firms with sophisticated investors and without overinvestment problems. However, there is a caveat: although we try to control for the main determinants of market reactions, we cannot not fully control for all omitted variables and the related endogeneity issue.

Given that capital markets may "see through" managerial myopia, we further explore why some managers nonetheless choose to behave myopically. To this end, we conduct regressions to examine the effects of managerial myopia on CEO total pay, earnings-based pay, and non-earnings-based pay. Our results show that CEOs who cut R&D myopically to increase earnings receive significantly higher total pay and earnings-based pay than those who would be able to present increased earnings should they engage in myopic behavior but who choose not to. These results suggest that higher pay may incentivize managers to engage in myopic behavior.

Although researchers argue that markets cannot be myopic, empirical evidence for this is limited. Our study contributes to the literature on managerial myopia and helps to reconcile previous findings on the subject. Furthermore, this work extends the literature on the economic consequences of real earnings management by providing evidence that markets penalize real earnings management behavior. Finally, we provide evidence suggesting that earnings-based compensation schemes may contribute to managerial myopia.

Appendix A. Sample Selection Process

Sample Selection Process	Obs. Removed	Obs. Remaining
Initial sample from Compustat and CRSP from 1996 to 2017		146,485
Eliminating firms with assets less than US$10 million or share prices less than US$1	(23,250)	123,235
Eliminating utilities and financial institutions	(31,025)	92,210
Eliminating firms with missing data for the dependent and independent variables	(22,667)	69,543
Limiting the sample to firms that have both the incentive and ability to cut R&D to meet earnings targets*	(66,962)	2,581
Eliminating observations for which R&D information is not available on the earnings announcement dates	(3)	2,578

* Firms are excluded unless their earnings before R&D and taxes have declined relative to the previous year but by an amount that can be reversed by a 20% reduction in R&D. Specifically, we compute earnings before tax and R&D (EBTRD) and exclude firms that do not satisfy the following inequation: "$-0.2 \times (R\&D_{t-1}) \leq EBTRD_t - EBTRD_{t-1} < 0$." We also exclude firms that cut R&D and that have missing data for the previous year's earnings.

Appendix B. Variable Definitions

Variables Used in the Baseline Model

RETURN: Measured as RAW_RET, MKT_ADJ_RET, and SIZE_ADJ_RET.

RAW_RET: Calculated as the cumulative returns within 2 days of the earnings announcement date.

MKT_ADJ_RET: Calculated as the cumulative market-adjusted abnormal returns within 2 days of the earnings announcement date. Market-adjusted abnormal returns are calculated using daily CRSP returns and adjusted by subtracting the cumulative market returns over the same period.

SIZE_ADJ_RET: Calculated as the cumulative size-adjusted abnormal returns within 2 days of the earnings announcement date. Size-adjusted abnormal returns are calculated using daily CRSP returns and adjusted by subtracting the cumulative average returns of firms in the same CRSP decile during the same period.

CUTRD: Dummy variable that equals 1 if a manager cuts R&D in year t (i.e., R&D expenditure is lower than in the previous year) and earnings in year t are not lower than those in year $t - 1$ and 0 if a manager does not cut R&D in year t and fail to meet the previous year's earnings.

SURPRISE_ANLST: Earnings surprises based on analyst forecasts, measured as the difference between actual earnings (as reported by IBES) and the most recent consensus analyst forecast (the median analyst forecast estimates as reported by IBES).

$\triangle$RD: R&D in year t minus R&D in year $t - 1$ scaled by assets.

SIZE: Natural logarithm of market value at the end of year t.

Q: Book value of assets minus the book value of equity, plus the market value of equity, scaled by the book value of assets at the end of the fiscal year.

MOMENTUM: Market-adjusted returns over the previous 6 months.

FILINGS: Natural logarithm of the total size of all filings submitted by a firm to the SEC within 2 days of the earnings announcement date.

NONGAAP: Difference between the disclosed non-GAAP earnings announced within 2 days of the earnings announcement date and actual earnings. We collect non-GAAP earnings by manually checking SEC filings from EDGAR.

CONFERENCE_CALL: Dummy variable that equals 1 if a firm has a conference call within 2 days of the earnings announcement date, and 0 otherwise. We collect information on conference calls from SeekingAlpha.com, Factiva, Bloomberg, and Thomson StreetEvents.

BDL_FORECAST: Difference between management's earnings forecasts announced within 2 days of the earnings announcement date and actual earnings. We obtain data on management forecasts from IBES.

M&A: Natural logarithm of the total transaction value of mergers and/or acquisitions announced within 2 days of the earnings announcement date. We collect data from the SDC database.

TURNOVER: Dummy variable that equals 1 if a firm announces management turnover within 2 days of the earnings announcement date, and 0 otherwise. We collect data by manually checking SEC filings on EDGAR and articles on Factiva.

NAME_CHANGE: Dummy variable that equals 1 if a firm announces a name change within 2 days of the earnings announcement date, and 0 otherwise. We collect data by manually checking SEC filings on EDGAR and articles on Factiva.

SURPRISE_LAG: Earnings surprises based on previous year earnings, measured as EARNINGS (earnings per share before extraordinary items in a given fiscal year) minus LAG_EARNINGS (earnings per share before extraordinary items in the previous fiscal year).

Variable Used in Investor Sophistication Analysis

INST_PERCENT: Percentage of shares held by non-quasi-indexing institutional investors.

Variables Used in Additional Tests

MYO_CUTTER: Dummy variable that equals 1 if a firm has R&D and EBTRD lower than the previous year but earnings higher than the previous year by less than 4 cents, and 0 otherwise.

OVERINV: Dummy variable that equals 1 if a firm's Tobin's Q is not greater than 1, and 0 otherwise.

ΔPAY: Change in a CEO's total pay (TOTAL_PAY), earnings-based pay (EARNINGS_PAY), or non-earnings-based pay (NONEARNINGS_PAY), calculated as the logarithm of CEO pay (total pay, earnings-based pay, or non-earnings-based pay) in year t minus the logarithm of CEO pay (total pay, earnings-based pay, or non-earnings-based pay) in year $t - 1$.

TOTAL_PAY: Sum of EARNINGS_PAY and NONEARNINGS_PAY.

EARNINGS_PAY: Dollar value of the bonus earned by a CEO during the fiscal year.

NONEARNINGS_PAY: CEO non-earnings-based pay, including salary, 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.

ΔROA: $ROA_{i,t} - ROA_{i,t-1}$. ROA is calculated as net income before extraordinary items divided by assets.

RET: Annual stock returns for the fiscal year.

LEV: Total debts divided by assets.

OWNERSHIP: CEO ownership as a percentage of shares outstanding.

TENURE: Number of years as the CEO of the firm.

EINDEX: Index based on six anti-takeover provisions: staggered board, poison pills, supermajority requirement for mergers, limits to shareholder bylaw amendments, limits to charter amendments, and golden parachutes.

BOARD_SIZE: Natural logarithm of the number of directors on the board.

BOARD_IND: Percentage of independent directors on the board.

CEO_DUALITY: Dummy variable that equals 1 if the CEO and the chairman of the board are the same person, and 0 otherwise.

RET_{t+i}: One-year stock returns from the earnings announcement date; $i = 1$, 2, or 3.

ROA_{t+i}: Returns on assets; $i = 1$, 2, or 3.

ROE_{t+i}: Returns on equity; $i = 1$, 2, or 3.

DACC: Measure of accrual earnings management, calculated as the absolute value of discretionary accruals computed using the modified Jones model.

RM: Measure of real earnings management, calculated as the sum of the three standardized real earnings management proxies, computed by following Roychowdhury (2006), that is, abnormal CFO (R_CFO), abnormal product costs (R_PROD), and abnormal discretionary expenses (R_DISX). "Production costs" is defined as the sum of the cost of goods sold and the change in inventory. Discretionary expenses in this study are the sum of advertising expenses and SG&A expenses.

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