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Breaking Free from Managerial Myopia: Government and Corporate Governance as Catalysts for Firm Innovation

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Abstract

Employing textual analysis of the "short-term vision" vocabulary in annual reports, we investigate the impact of managerial myopia on firm innovation and performance. Our results indicate that managerial myopia hampers innovation, and this result remains robust across a battery of robustness checks. Managerial myopia also weakens the positive impact of innovation on firm growth, and value in the long run. We find that state ownership and good corporate governance mitigate the negative impact of managerial myopia. The evidence supports the upper echelon theory and time orientation theoretical framework. This paper enriches the research on the influencing factors of corporate innovation, by providing evidence that people's perception of time affects decision making and provides support for government ownership and strong corporate governance practices in alleviating the negative consequences of managerial myopia.

Keywords: managerial myopia; firm innovation; state ownership; corporate governance

JEL Classification: G30; F40; O10; P21

1. Introduction

The time orientation psychology theory suggests that there are large differences in people's perception of time (Keough et al., 1999). It can result in overemphasizing the past, present, or future when people make decisions (Van Ittersum, 2012). Myopia often stems from a sense of urgency at the time of the event, which induces managerial preference towards short-term profitability (C. Chen et al., 2023) and results in delayed or renunciation of the firm's long-term strategy. Consistent with the upper echelon theory where strategic decisions are influenced by top management team characteristics (Hambrick & Mason, 1984), time perception is likely to be an important personal characteristic that is especially critical for managers' decisions involving risky long investment and return cycles, such as innovation. Innovation, which affects firms' competitiveness (C. Chen et al., 2016), requires a large amount of continuous investment with long return cycles, possibly leading to high operational risk and lower short-term profitability. Such characteristics of innovation are likely to trigger time perception preferences in decision makers.

The question concerns whether myopic managers exhibit short time orientation and pursue short-term returns, or whether long-term investments such as innovation projects are sacrificed. The conflicts between managerial myopia behavior and firm prospects are

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worth investigating in the corporate governance field, particularly to determine the mitigating factors of such behavior. Following the time orientation and upper echelon theories, myopic managers neglect innovation investment, thereby damaging future innovation performance. How the firm mitigates the negative impacts of management's short-sightedness on innovation performance becomes the key research question in our study. The Chinese government uses state-owned enterprises (SOEs) to solve issues that cannot be solved by the market itself (K. J. Lin et al., 2020), including maximizing resource mobility through interventions (J. Y. Lin & Tan, 1999), and mitigating stock price crash risk by reducing firm sensitivity to policy uncertainty (Xie et al., 2023). More specifically, government intervention in SOEs can influence firm goals to be consistent with the government's long-term interests. Therefore, state ownership may influence the relationship between management myopia and innovation performance. Furthermore, corporate governance may also moderate the negative impact of managerial short-sightedness on long-term investments (e.g., Hu et al., 2021; Z. Fan et al., 2024). Therefore, in this paper, we add to the literature by investigating whether government control and various types of corporate governance mechanisms moderate the negative influence of myopia on innovation.

We choose China as the setting for our study for several reasons. First, large segments of the literature have explored that traditional Confucianism emphasizes the long-term orientation of this culture (e.g., Rarick, 2007; Z. Tang, 1995). However, if this culture is deeply rooted in the minds of the Chinese people, then how can we explain some of today's phenomena in China that are not conducive to long-term economic growth, such as low fertility and environmental pollution. We argue that as economic activity rises, some opportunistic behaviors will intensify. Opportunism is often driven by myopia, as people or organizations chase short-term rewards without considering future risks or opportunities (Cho et al., 2019). Evidence has been found in Xi et al. (2018)'s study that personal opportunism is prevalent in public policy making that pursues short-term economic growth, among some Chinese city officials. Thus, conducting research towards managerial myopia behavior in China is necessary.

Second, according to the Linguistic Savings Hypothesis (LSH), native language affects economic behavior (Thoma & Tytus, 2018). J. Tang et al. (2021) argue Chinese is a weak future-time reference (FTR) language which is more short-term focused than strong FTR languages such as English, and therefore it may affect long-term risky decisions. By adapting text mining, we explore whether managers' time perception affects firm's long-term decision and performance. Third, considering innovation has been recognized as the key embodiment of firms' sustainable competitiveness and economic growth (Chuluun et al., 2017), we investigate factors that mitigate the negative impact of managerial myopia on innovation which would be particularly useful to policy makers and investors. Fourth, as a common feature of Chinese firms, government ownership performs a significant role in the economy. Our study, by linking government and managerial myopia behavior, enriches the literature on the positive effects of government ownership on firms.

We measure managerial myopia following the approach of Hu et al. (2021) to construct Chinese "short-term vision" vocabulary using textual analysis and machine learning that identifies myopic words from the management discussion and analysis (MD&A) section in annual reports. Using the same method, the literature finds that myopia decreases total factor productivity (Sheng et al., 2022), and reduces firm ESG engagement (H. Liu & Zhang, 2023) and firm value (Z. Fan et al., 2024). In our study, we use Panel data of 8944 firm year observations to examine the relationship between managerial myopia and firm innovation. We find that myopia has a negative effect on R&D investment, patent applications, and patent grants. The result is robust to include additional fixed effects, add forward values of innovation measures, and the propensity score match-

ing (PSM) approach. To address the potential endogeneity concern, we introduce the 2SLS–instrumental variable (IV) approach. Existing evidence suggests that managers operating in regions with stronger gambling cultures are more likely to engage in speculative investment and financial misreporting (Y. Chen et al., 2014; Christensen et al., 2018). Building on this literature, we posit that stronger local gambling preferences foster managerial short-term orientation and myopic decision making, and, accordingly, measure provincial-level gambling preference using total welfare lottery sales scaled by GDP (Ji et al., 2021) as an instrumental variable to capture the exogenous variation in managerial myopia, following Sheng et al. (2022). We find that management myopia is more serious in the regions with higher lottery expenditures. The second stage result is consistent with the baseline findings, which indicates our baseline findings are robust without endogeneity concerns.

In addition, we examine whether the reduction in firm innovation associated with managerial myopia translates into weaker long-term firm prospects. Following Z. Fan et al. (2024), we introduce Tobin's Q as the dependent variable capturing firms' growth opportunities. Our results show that managerial myopia significantly attenuates the positive effect of innovation on firms' growth opportunities. Given that managerial myopia undermines both innovation outcomes and long-term growth, this finding motivates further investigation into mechanisms that can mitigate the adverse effects of managerial myopia.

Government ownership may mitigate this negative effect. In contrast to the value maximization goals of private firms, SOEs have additional national development goals (Xin et al., 2019; Xie et al., 2023), indicating that SOE managers may be more long-term orientated and less burdened with short-term profit maximization. Thus, myopic behaviors are potentially less evident among SOE managers. In addition, as regulatory authorities, the government pays more attention to the development path of firms, especially for SOEs, to ensure that their operation strategy aligns with the interests of stakeholders and the direction of national policies. As an important means of high-quality development and deepening reform in China, firm's R&D and innovation performance is valued. Thus, short-time orientation bias towards innovation may be less prevalent among SOE managers. By adapting heterogeneity tests, we find the government ownership and policies moderate the negative impact of managerial myopia on firm innovation.

Further, good corporate governance may mitigate the negative impact of managerial myopia on firms' total factor productivity, financial asset allocation, and ESG performance (e.g., Sheng et al., 2022; C. Chen et al., 2023; Z. Fan et al., 2024; Duppati et al., 2023). Therefore, we argue that corporate governance may mitigate the negative effects of managerial myopia of firms' innovation investment. This is what we find. Good corporate governance factors, namely having institutional investors, top auditors, independent directors, and gender diversity in the board, moderate the negative impact of management myopia on firm innovation. More importantly, the effect of corporate external monitoring is more significant than internal governance.

The contributions of this paper are as follows. First, we examine the causes of firm innovation from the perspective of cognitive psychology, specifically managerial myopia, which has been discussed (e.g., Yu et al., 2024), but not extensively tested in terms of innovation performance, efficiency, and its negative impact in the long run using the textual mining approach. Thus, we expand the research on the influencing factors of firm innovation decisions and performance from the perspective of the managers' psychological characteristics.

Second, previous studies (e.g., J. Tang et al., 2021; Thoma & Tytus, 2018) show institutional settings such as language's FTR may influence time preference, with weak FTR languages like Chinese being short-term focused. By adapting the text mining approach and capturing short-termism words from firms' annual reports, we find that managerial short-

term preferences, namely myopia, negatively affect long-term risky investments such as innovation. We argue weak-FTR-language countries could be particularly susceptible to this influence, and we explore several ways of moderating the negative impact of management myopia, which is particularly important for both policymakers and investors.

Third, we add to the literature by providing insight into whether government intervention works when managers are myopic in the face of firms' long-term investment. The results of this paper show that government ownership, political intervention, and effective corporate governance are conducive to moderating management myopia effects on corporate innovation activities. This provides further evidence of the positive effects of the government on firms and is a timely addition to the literature in the field of corporate governance and innovation studies.

The remainder of paper is as follows. Section 2 discusses the literature and develops our hypotheses. In Section 3, we discuss our research design. We present the empirical results in Section 4 and explore some further analyses in Section 5. Section 6 concludes the paper.

2. Literature Review and Hypothesis Development

The time orientation theory in psychology holds that people have very different perceptions of time, and their attitudes and behavior towards specific events have both long-term and short-term orientations (Keough et al., 1999; Edmans et al., 2017). People with a short-term orientation focus more on opportunism, while people with a long-term orientation prefer future possibilities (T. Wang & Bansal, 2012). In addition, rapid economic growth has accelerated this opportunistic and short-sighted behavior (Xi et al., 2018). According to the upper echelon theory (Hambrick & Mason, 1984), which is widely used in management, the strategic decision making of enterprises is affected by many characteristics of managers, such as age, education, gender, and psychological characteristics (Manner, 2010). Applying time tendency in psychology to the upper echelon theory helps us observe how managers' perception of time, as an important personal characteristic, affects corporate decision making.

The existing literature shows that managers with a long-term perspective carefully consider the future results of investments and the long-term development of the enterprise when making decisions (J. Chen & Nadkarni, 2017). Managers who have a long-term orientation prioritize potential future benefits over short-term costs (Sherf et al., 2019). On the contrary, myopic managers focus on the immediate consequences of decisions, hindering the recognition of future opportunities and prompting managers to prioritize current profits over long-term interests (Hu et al., 2021). Empirical research shows consideration for current performance and stock performance: short-sighted managers prefer short-term financial performance at the expense of long-term corporate interests. Therefore, they are more inclined to choose projects with short duration and high returns (Holmström, 1999).

In addition to managers' personal time preferences, language itself may also contribute to managerial myopia behavior. The literature argues Chinese is a weak FTR language which is more short-term focused than strong FTR languages such as English, and therefore managers of Chinese firms could be particularly susceptible to the influence of myopia (J. Tang et al., 2021). However, findings based on managers' short-sighted behavior and firm innovation are currently unclear. Richardson (2006) found that short-sighted managers can be overconfident and overinvest in high-cost projects. As such, myopia may lead managers to overemphasize the benefits and/or downplay the uncertainties of innovation and thereby increase R&D investment as a result. However, Hu et al. (2021) found that short-sighted managers reduce R&D expenditure, because innovation requires continuous investment of large amounts of capital, with a long return cycle and high operating risks.

Sheng et al. (2022) found that managerial myopia is closely related to innovation attenuation, as investment in innovation is considered harmful to short-term profits. Accordingly, we propose our first hypothesis:

H1: *Managerial myopia has a negative impact on firm innovation.*

SOEs play a significant role in China. Based on the Fortune Global 500 data in 2017, 75 of the 102 FG500 SOEs were from China (K. J. Lin et al., 2020). In terms of firm performance, according to the State-owned Assets Supervision and Administration Commission of the State Counsil (SASAC), the total sales income from Chinese SOEs reached 85.7 trillion Chinese RMB in 2023. How well the government performs its ownership and functions in SOEs, including pursuing both economic and political benefits, depends on the quality of its governance (Dinc & Gupta, 2011; J. P. Fan et al., 2013). Many studies reveal government intervention affects corporate governance, and, particularly in SOEs (e.g., X. Zhang et al., 2020). Xie et al. (2023), they find that state control reduces stock price crash risk through implementing conservative policies. Jia et al. (2019) find that state control enhances the functionality of corporate governance instruments and further reduces agency risk in innovation. In addition, even though Chinese SOEs have evolved to more market orientation organizations over the last 40 years, they still have strong obligations to fulfill political goals (Q. Liu et al., 2019). McWilliams et al. (2006) find SOEs' response to government mandates is a key driver of managerial decision making. Therefore, we argue that the prevalence of state ownership and the government's influence on SOEs' management decisions will be monitored and politically guided by government intervention. More specifically, government ownership will reduce myopic behavior since managers are tasked with social and political goals in addition to the profit maximization objective of private firms (Xin et al., 2019). As such, they may be less concerned with short-run profitability, and therefore more likely to engage in innovation investment.

In addition, as innovation is strategically significant to countries' future prospects (Hsu et al., 2014), the government's long-term national goals help negate managerial myopia towards firm innovation. Thus, our second hypothesis is presented as follows:

H2: *State ownership has a moderating role in the negative relationship between managerial myopia and firm innovation.*

Many scholars have previously tested the role of corporate governance moderators in constraining and balancing firm-specific behavior (e.g., Hu et al., 2021; Z. Fan et al., 2024). These influences include internal factors such as board characteristics, as well as external stakeholders of the firm, such as creditors, auditors, and institutional investors.

Zeng and Wu (2012) find that female executives in China mitigate agency problems through less financial manipulation and have a positive impact on firm innovation as a result. Allen et al. (2005) find that board structure affects firm decision making. Independent directors have a positive impact on reducing agency costs and improving the corporate governance environment (Balsmeier et al., 2016), while institutional investors perform an external governance monitoring role (Jiang & Yuan, 2018). In addition, the improvement of audit quality reduces information asymmetry and improves governance transparency (Reichelt & Wang, 2010). In summary, we infer that a higher level of corporate governance promotes the cultivation of firms' long-term goals and reduces management opportunism, thereby moderating the negative impact of managerial myopia on corporate innovation.

Based on the above discussion, we propose the third hypothesis:

H3: *Good corporate governance has a moderating role on the negative relationship between managerial myopia and firm innovation.*

3. Research Design

3.1. Sample and Source of Data

This paper employs a sample of A-share listed firms in China's Shanghai and Shenzhen markets from 2015 to 2020. In line with common practices in the previous finance literature (e.g., L. Wang et al., 2021; C. Chen et al., 2023), we first exclude firms from financial industries, since they have unique characteristics compared with other industries, for example, the management of intangible assets and capital structure. Second, we exclude special treatment firms to mitigate the bias of survivorship effect. After removing observations with missing data, the final sample consists of 8944 firm-year observations for 2014 unique firms. All the continuous variables are winsorzied at the 1% level at both tails of their distributions to reduce the influence of outliers. The detailed definitions of the relevant variables in the study are reported in Table A1. The variables used in this study are obtained from a series of databases, which include firms' annual reports, Chins Stock Market Accounting Research (CSMAR), Wind, Huazheng ESG Index, and the National Bureau of Statistics of China (NBSC).

3.2. Measurement of Variables

3.2.1. Measures of Managerial Myopia

We adopt managerial myopia (Myopia) as the main independent variable. The conceptual complexity of myopia makes its measurement challenging[1]. Following recent studies using textual analysis and machine learning methods (Brochet et al., 2015; Hu et al., 2021), we build a "short-term horizon" vocabulary in Chinese and confirm its validity with the short-sightedness indicator after an actual comparison, internal consistency test, and credibility test. We train a GloVe model on corporate textual disclosures from the MD&A[2] part in annual reports and use the trained model to predict words with similar semantics to the seed words. We finally identify 37 myopia words, which include 28 short-term horizon words and 9 pressure words. Details of words are reports in Appendix A Table A3. Then, based on the word set, the ratio of the total word frequency of the "myopia words" to the total word frequency of MD&A is calculated using the dictionary method. We multiply 100 to generate the manager's myopia attention index. The higher the value of the index, the more myopic the management team is.

3.2.2. Measures of Firm Innovation

Following the previous literature (e.g., Ho et al., 2004; Kong et al., 2020), we measure a firm's innovation performance from both an input and output perspective. The dependent variable of innovation input is based on R&D expenditure. Companies with missing R&D information have been removed from the sample and we scale real R&D expenditure by total assets and create the variable R&D ratio (R&D).

We measure the output performance with two patent-based metrics. The first metric is the quantity of output, defined as the natural logarithm of one plus the number of patent applications (PA) of the firm in the current year. The second metric is the quality of output, defined as the natural logarithm of one plus the number of patents that are eventually granted (PG) in a year.

3.2.3. Control Variables

Financial data are retrieved from the CSMAR database and Wind database. Following the previous literature on corporate innovation and managerial behavior (Faleye et al.,

2014; J. Zhang et al., 2023), we control firm-level variables including company size (Firm Size), firm age (Firm Age), debt ratio (Leverage), and return on assets (ROA). We also include the ratio of market value and book value of total assets (Tobin's Q), and the cash ratio (Cash Ratio). We consider the role of government subsidies (Subsidy) in firm innovation behavior (Guo et al., 2016). We also include a dummy variable indicating whether a firm is controlled by the government (*SOE*).

As corporate governance influences firm innovation performance (e.g., C. H. Chang & Wu, 2021; Song & Chen, 2023), we control the number of independent directors to the total number of directors on the board (Independence), the number of directors (Board Size), and the largest shareholding (Concentration). C. Chen et al. (2016) show that CEO characteristics, managerial skills, and executive compensation affect innovation performance. Therefore, we control for the CEO's age (CEO Age), tenure (CEO Tenure), gender (CEO Gender), educational background (CEO Education), power (CEO Duality), as well as the compensation of the company's top three highest paid executives (Gpay). Finally, we include the annual GDP growth rate in a province during the fiscal year (GDP Growth).

3.3. Model Specification

To test our main hypothesis, the following OLS regression model is designed based on the previous research methods of Hu et al. (2021) and Z. Fan et al. (2024):

$$\begin{aligned} Innovation_{i,t} = {} & \alpha + \beta_1 Myopia_{i,t} + \beta_2 Firm\ Size_{i,t} + \beta_3 Leverage_{i,t} + \beta_4 Firm\ Age_{i,t} + \beta_5 Tobin's\ Q_{i,t} + \beta_6 ROA_{i,t} + \beta_7 Cash\ Ratio_{i,t} + \\ & \beta_8 Subsidy_{i,t} + \beta_9 SOE_{i,t} + \beta_{10} Independence_{i,t} + \beta_{11} Board\ Size_{i,t} + \beta_{12} Concentration_{i,t} + \beta_{13} CEO\ Age_{i,t} + \\ & \beta_{14} CEO\ Tenure_{i,t} + \beta_{15} CEO\ Gender_{i,t} + \beta_{16} CEO\ Education_{i,t} + \beta_{17} CEO\ Duality_{i,t} + \beta_{18} Gpay_{i,t} + \beta_{19} GDP\ Growth_{i,t} + \\ & \sum \text{Industry FE} + \sum \text{Year FE} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

The dependent variables for Innovation in the regression include innovation input (R&D), innovation output quantity (PA), and innovation output quality (PG), respectively. The independent variable is managerial myopia (Myopia), and others are control variables. The model controls for industry fixed effect and year fixed effect, while *t*-statistics are calculated from the robust standard errors clustered at the firm level.

4. Empirical Results

4.1. Summary Statistics

Table 1 reports the sample descriptive statistics. The average value of Myopia is 0.12 with the standard deviation of 0.088. The results are very similar to previous studies using the same text mining approach (e.g., J. Zhang et al., 2023). The R&D expense of an average firm accounts for 2% of total assets, and the means of patent application and patent grant are 3.218 and 2.861, which are consistent with the existing literature (e.g., J. Fan et al., 2022; Kong et al., 2020). In terms of control variables, the average leverage ratio is 43.4%, and the average ROA is 3.1%. The average board size is nine members, nearly 38% of whom act as independent directors. This composition structure complies with the China Securities Regulatory Commission (CSRC) standards. The average age of CEOs in our sample is around 49 years with an average education level of bachelor's degree. Overall, the distribution of the control variables in our sample is consistent with previous Chinese studies (e.g., L. Wang et al., 2021).

Table 1. Summary statistics.

Variables	N	Mean	S.D.	Min	25%	Median	75%	Max
R&D	8944	0.021	0.019	0	0.008	0.018	0.029	0.099
PA	8944	3.217	1.641	0	2.197	3.332	4.277	7.276
PG	8944	2.859	1.568	0	1.792	2.944	3.892	6.843

Table 1. *Cont.*

Variables	N	Mean	S.D.	Min	25%	Median	75%	Max
Myopia	8944	0.120	0.088	0	0.055	0.102	0.165	0.423
Firm Size	8944	22.502	1.227	20.154	21.642	22.340	23.197	26.302
Leverage	8944	0.432	0.196	0.066	0.279	0.426	0.579	0.898
Firm Age	8944	2.990	0.253	2.305	2.833	2.998	3.162	3.610
Tobin's Q	8944	2.122	1.410	0.836	1.233	1.667	2.441	8.758
ROA	8944	0.032	0.071	−0.303	0.011	0.034	0.064	0.211
Cash Ratio	8944	0.140	0.101	0.012	0.067	0.114	0.182	0.513
Subsidy	8944	0.005	0.005	0	0.002	0.003	0.006	0.027
SOE	8944	0.352	0.478	0	0	0	1	1
Independence	8944	0.375	0.053	0.333	0.333	0.333	0.429	0.571
Board Size	8944	2.127	0.197	1.609	1.946	2.197	2.197	2.708
Concentration	8944	0.327	0.140	0.088	0.218	0.304	0.418	0.708
CEO Age	8944	3.892	0.138	3.466	3.807	3.912	3.989	4.174
CEO Tenure	8944	4.855	3.608	1	2	4	7	17
CEO Gender	8944	0.936	0.244	0	1	1	1	1
CEO Education	8944	3.159	1.278	1	2	4	4	5
CEO Duality	8944	0.256	0.437	0	0	0	1	1
Gpay	8944	14.532	0.667	12.967	14.093	14.504	14.926	16.438
GDP Growth	8944	0.075	0.053	−0.192	0.053	0.077	0.107	0.202

This table presents summary statistics for main variables in our samples. All variables are defined in Table A1.

4.2. Sample Distribution

Table 2 shows the sample distribution of our main independent variables managerial myopia (Myopia) across years, industries, and provinces.

Table 2. Sample distribution.

Panel A	Myopia
Myopia across years	
Year	
2015	0.137
2016	0.118
2017	0.111
2018	0.118
2019	0.125
2020	0.119
Panel B	**Myopia**
Myopia across industries	
Industry	
Transportation	0.182
Mining	0.176
Electricity, Gas, and Water	0.170
Real estate	0.162
Comprehensive	0.156
Wholesale and Resale Trade	0.133
Construction	0.131
Culture, Sports, and Entertainment	0.125
Agriculture, Forestry, Animal Husbandry, and Fishery	0.124
Manufacturing	0.116
Public Facilities' Management	0.110
Scientific Research and Services	0.103
Leasing and Business Services	0.092

Table 2. *Cont.*

Accommodation and Catering	0.089
Health and Social Service	0.076
Information Technology	0.073
Education	0.070
Panel C	**Myopia**
Myopia across provinces	
Province	
Xizang	0.184
Shanxi	0.173
Qinghai	0.172
Heilongjiang	0.172
Gansu	0.166
Chongqing	0.156
Hainan	0.151
Shaanxi	0.147
Guangxi	0.142
Shanghai	0.138
Sichuan	0.137
Inner Mongolia	0.135
Guizhou	0.133
Tianjin	0.132
Yunan	0.130
Ningxia	0.129
Liaoning	0.128
Anhui	0.127
Xinjiang	0.124
Jiangsu	0.123
Henan	0.123
Fujian	0.122
Hebei	0.118
Hubei	0.117
Jiangxi	0.117
Zhejiang	0.115
Hunan	0.115
Jilin	0.114
Shandong	0.114
Beijing	0.111
Guangdong	0.098

This table presents the mean of managerial myopia by year, industry, and province, respectively.

Panel A shows the yearly distribution of the annual average managerial myopia index. From 2015 to 2017, we can notice a decreasing trend, before it increases up until 2019. The index drops to 0.119 in 2020, with 6% drop compared with the number in 2019. Panel B reports the average myopia index distribution at the industry level using the one-digit CSRC industry code. The highest myopia index is from transportation industry with the mean of 0.182 while the lowest number 0.07 for the education industry. The Panel reflects significant differences between industries. In Panel C, we see that there are also great differences in the managerial myopia index between regions. To be specific, we draw a heat map of the myopia index of each province using the average number during the sample period. Figure 1 represents the behavior of managerial myopia in each province of China. The darker the color, the higher the variable value. We find that, on average, myopic managers are more concentrated in the central and south-western provinces. Overall, Panel C and Figure 1 imply large variations in the key independent variable across the different regions.

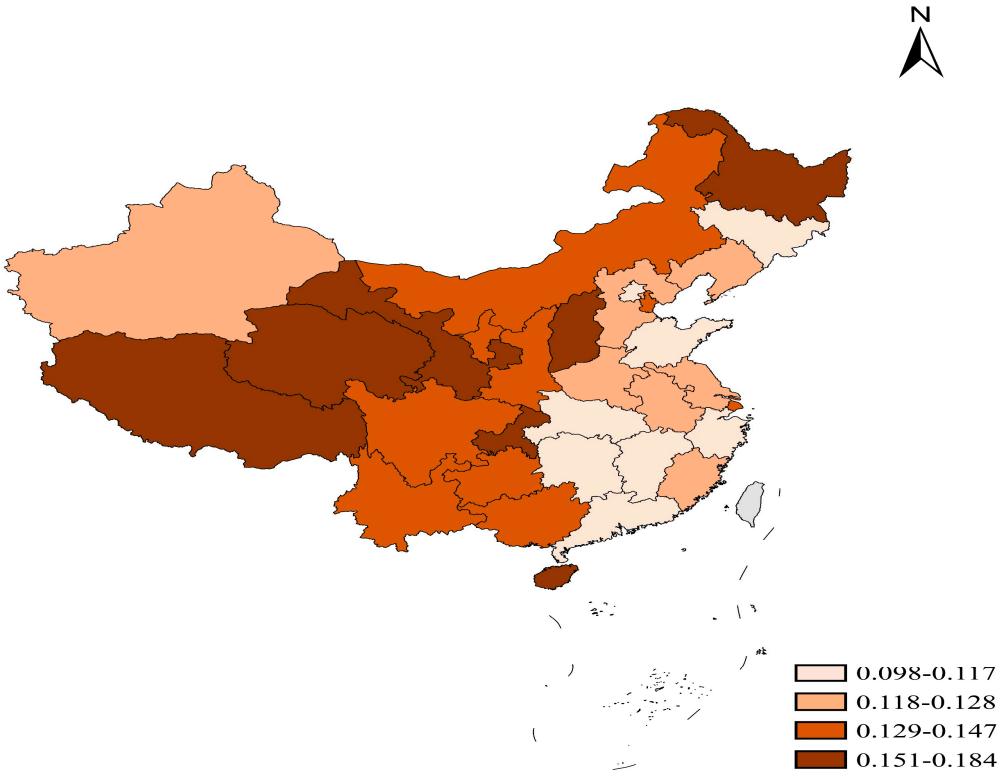

Figure 1. Geographical characteristics of managerial myopia.

4.3. Correlation Analysis

Table 3 shows the correlation matrix for independent variables. Most of the correlations reported are between −0.30 and 0.30. We also run the VIF test and the highest and mean VIF of our sample is 2.46 and 1.33 (results can be provided on request). Overall, the correlations and VIF results do not indicate any serious multicollinearity problems.

4.4. Baseline Results

Table 4 reports the baseline results of Equation (1), which utilize regression models to explore the relationship between managerial myopia and firm innovation decision and performance. We display all the control variables and include industry-fixed and year-fixed effects. In all model specifications, the coefficients of managerial myopia (*Myopia*) are negative and statistically significant at the 1% level; this supports our hypothesis 1, namely, that managerial myopia is negatively associated with firm innovation. To assess economic significance, we examine the effect of a one-standard-deviation increase in managerial myopia on the innovation outcomes. A one-standard-deviation increase in managerial myopia leads to a 0.001 decrease in R&D investment, representing approximately a 5.4% decline relative to the sample mean. The same increase in myopia reduces patent applications and patent grants by about 2.6%, each relative to their respective means. Overall, these magnitudes indicate that the effects of managerial myopia on corporate innovation are not only statistically significant but also economically meaningful, reinforcing the practical importance of managerial time horizons in shaping innovation outcomes.

Table 3. Correlation matrix.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Myopia	1																		
2. Firm Size	0.190	1																	
3. Leverage	0.180	0.494	1																
4. Firm Age	0.091	0.122	0.120	1															
5. Tobin's Q	−0.111	−0.465	−0.321	−0.142	1														
6. ROA	−0.079	0.087	−0.312	−0.029	0.166	1													
7. Cash Ratio	−0.083	−0.155	−0.321	−0.019	0.237	0.214	1												
8. Subsidy	−0.050	0.165	−0.055	−0.033	0.130	−0.006	0.013	1											
9. SOE	0.262	0.355	0.277	0.154	−0.176	−0.040	0.019	−0.041	1										
10. Independence	−0.039	−0.004	0.001	−0.065	0.045	−0.022	0.033	0.040	−0.041	1									
11. Board Size	0.121	0.271	0.141	0.107	−0.141	0.039	−0.034	−0.055	0.266	−0.547	1								
12. Concentration	0.140	0.238	0.066	−0.080	−0.046	0.141	0.072	−0.071	0.276	0.054	0.054	1							
13. CEO Age	0.092	0.124	0.040	0.063	−0.050	0.043	0.010	0.007	0.140	0.017	0.072	0.086	1						
14. CEO Tenure	−0.027	−0.025	−0.074	0.075	0.018	0.066	0.004	0.029	−0.153	0.021	−0.012	−0.094	0.276	1					
15. CEO Gender	0.054	0.043	0.027	−0.019	−0.035	0.016	−0.025	0.017	0.081	−0.082	0.095	0.012	0.007	−0.010	1				
16. CEO Education	0.051	0.093	0.044	0.034	−0.010	0.010	0.019	0.035	0.151	−0.012	0.077	0.021	−0.034	−0.018	−0.009	1			
17. CEO Duality	−0.144	−0.143	−0.103	−0.095	0.092	0.016	0.013	0.030	−0.292	0.109	−0.182	−0.072	0.151	0.243	−0.008	−0.069	1		
18. Gpay	0.004	0.432	0.110	0.182	−0.124	0.172	0.048	0.028	0.038	0.001	0.100	0.001	0.112	0.056	0.014	0.086	−0.004	1	
19. GDP Growth	−0.029	−0.035	−0.044	−0.098	0.004	0.040	0.034	0.005	−0.044	0.008	0.005	0.001	−0.026	0.011	0.025	−0.008	0.036	−0.001	1

This table displays the correlation statistics of main variables. All variables are defined in Appendix A Table A1. VIF is also tested, and the results show that there is no multicollinearity issue in our model.

Table 4. Baseline.

	(1)	(2)	(3)
VARIABLES	**R&D**	**PA**	**PG**
Myopia	−0.013 ***	−0.938 ***	−0.829 ***
	(−4.811)	(−3.983)	(−3.600)
Firm Size	−0.001 ***	0.602 ***	0.554 ***
	(−3.051)	(20.034)	(18.608)
Leverage	−0.001	−0.039	−0.031
	(−0.380)	(−0.247)	(−0.205)
Firm Age	−0.002	−0.224 **	−0.170
	(−1.564)	(−2.085)	(−1.635)
Tobin's Q	0.002 ***	0.006	−0.009
	(5.741)	(0.322)	(−0.505)
ROA	0.010 **	0.475	−0.206
	(2.349)	(1.551)	(−0.715)
Cash Ratio	0.009 ***	0.160	0.121
	(2.641)	(0.685)	(0.549)
Subsidy	0.717 ***	39.695 ***	38.382 ***
	(8.811)	(8.712)	(8.606)
SOE	0.001	0.140 **	0.106 *
	(0.713)	(2.261)	(1.779)
Independence	0.016 **	−0.061	0.011
	(2.470)	(−0.111)	(0.021)
Board Size	−0.001	0.084	0.071
	(−0.243)	(0.498)	(0.461)
Concentration	−0.002	−0.281	−0.027
	(−0.912)	(−1.406)	(−0.143)
CEO Age	−0.002	0.084	0.009
	(−0.935)	(0.472)	(0.056)
CEO Tenure	0.000 ***	0.015 **	0.013 **
	(3.350)	(2.206)	(2.062)
CEO Gender	0.002	0.142	0.105
	(1.233)	(1.580)	(1.280)
CEO Education	0.000	0.039 **	0.030 *
	(1.289)	(2.191)	(1.761)
CEO Duality	0.000	0.016	0.007
	(0.299)	(0.292)	(0.131)
Gpay	0.005 ***	0.184 ***	0.173 ***
	(9.656)	(4.484)	(4.299)
GDP Growth	0.011 ***	1.971 ***	1.938 ***
	(2.755)	(5.250)	(5.586)
Constant	−0.025 **	−13.470 ***	−12.314 ***
	(−2.041)	(−13.582)	(−12.894)
Observations	8944	8944	8944
Adjusted R^2	0.389	0.410	0.417
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

The sample consists of 8944 firm-year observations between 2015 and 2020. The dependent variable is the firm innovation input measured by R&D expenditure (R&D), innovation output quantity measured by the numbers of patent application (PA), and innovation output quality measured by the numbers of patent grant (PG). The independent variable is the indicator of managerial myopia (Myopia) based on the textual analysis. All variables are defined in Appendix A Table A1. The *t*-statistics in parentheses are calculated from the robust standard errors clustered at the firm level. The symbols ***, **, and * denote a significance level at the 1%, 5%, and 10% levels, respectively.

As for the control variables, our findings demonstrate that firms with higher ROA and Tobin's Q invest more in innovation activities. The negative association between firm size and R&D intensity likely reflects a denominator effect, as R&D is measured relative to firm

scale, while larger firms may still spend more on R&D in absolute terms. At the same time, firm size is positively related to patent applications and grants, consistent with the view that larger firms possess greater organizational, legal, and financial resources to transform R&D activities into granted innovations. These findings are consistent with the previous literature (e.g., Faleye et al., 2014).[3] Additionally, CEOs with a longer tenure and higher education level contribute to better corporate innovation performance. Overall, the regression results of the control variables are consistent with prior studies (e.g., Guo et al., 2016).

4.5. Robustness Tests

We next conduct a series of tests to ensure our results are robust.

4.5.1. Test of Innovation Efficiency

Following Quan and Yin (2017), we construct an indicator of innovation efficiency (*Efficiency*) based on the number of patent applications per unit of R&D investment, expressed as Ln(1 + PA)/Ln(1 + R&D investment). Furthermore, we take the forward values of Efficiency to examine whether the relationship endures over time. The regression results in Panel A of Table 5 show that the regression coefficients of Myopia in the regression models of innovation efficiency are all significantly negative, indicating that managerial myopia affects the current and forward values of innovation efficiency.

Table 5. Robustness test.

Panel A. Test of Innovation Efficiency				
	(1)	**(2)**	**(3)**	**(4)**
VARIABLES	**Efficiency**	**Efficiency$_{t+1}$**	**Efficiency$_{t+2}$**	**Efficiency$_{t+3}$**
Myopia	−0.043 ***	−0.046 ***	−0.054 ***	−0.042 **
	(−3.448)	(−3.243)	(−3.499)	(−2.502)
Constant	−0.499 ***	−0.486 ***	−0.459 ***	−0.433 ***
	(−9.708)	(−8.424)	(−7.569)	(−6.536)
Observations	8944	6301	4859	3471
Adjusted R^2	0.326	0.318	0.321	0.312
Control	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Panel B. Forward Looking					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
VARIABLES	**R&D$_{t+1}$**	**PA$_{t+1}$**	**PG$_{t+1}$**	**PA$_{t+2}$**	**PG$_{t+2}$**
Myopia	−0.014 ***	−1.020 ***	−0.895 ***	−1.182 ***	−1.027 ***
	(−4.430)	(−3.799)	(−3.525)	(−4.075)	(−3.702)
Constant	−0.021	−13.402 ***	−11.801 ***	−13.082 ***	−11.325 ***
	(−1.479)	(−11.993)	(−11.069)	(−11.089)	(−9.728)
Observations	6301	6301	6301	4859	4859
Adjusted R^2	0.373	0.401	0.418	0.401	0.412
Control	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

Table 5. *Cont.*

Panel C. Remove Big Cities			
	(1)	(2)	(3)
VARIABLES	R&D	PA	PG
Myopia	−0.007 **	−1.376 ***	−1.321 ***
	(−2.107)	(−4.237)	(−4.153)
Constant	−0.017	−13.286 ***	−11.821 ***
	(−1.155)	(−9.858)	(−8.828)
Observations	4268	4268	4268
Adjusted R^2	0.318	0.372	0.368
Control	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Panel D. Add Fixed Effects to Alleviate the Issue of Missing Variables			
	(1)	(2)	(3)
VARIABLES	R&D	PA	PG
Myopia	−0.011 ***	−0.799 ***	−0.675 ***
	(−3.960)	(−3.380)	(−2.921)
Constant	−0.028 **	−14.324 ***	−12.859 ***
	(−2.249)	(−13.981)	(−13.147)
Observations	8944	8944	8944
Adjusted R^2	0.406	0.426	0.433
Control	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes
Province FE	Yes	Yes	Yes

Table 5 reports the robustness test results. In Panel A, we test the innovation efficiency. Efficiency measures how much output the firm achieves in terms of one unit of R&D expenditure, calculated as Ln (1 + PA) divided by Ln (1 + R&D investment). In Panel B, we take the one-year forward value of all the dependent variables first, and the results are presented in columns (1), (2), and (3). Furthermore, we take the two-year forward value of innovation output measurements and show the results in columns (4) and (5). In Panel C, we remove the key cities in the sample and rerun the baseline regression. In Panel D, we add the fixed effect of province and joint effect of industry and year. All the variables are defined in Table A1. The *t*-statistics in parentheses are calculated from the robust standard errors clustered at the firm level. The symbols ***, **, and * denote a significance level at the 1%, 5%, and 10% levels, respectively.

4.5.2. Forward Values of Innovation Measures

According to Brick et al. (2006), there exists a time lag between management decisions and firm performance. To be specific, our study focuses on the effect of managerial myopia on firm innovation performance, and there is likely to be a lag between managerial behavior and the implementation of firm policies and their performance. To address this concern, we take the one-year forward value of our innovation measurements, which are the one-year forward value of R&D expenditure ($R\&D_{t+1}$), the one-year forward value of patent application (PA_{t+1}), and the one-year forward value of patent grant (PG_{t+1}). Another issue, as suggested by the innovation literature (e.g., Kong et al., 2020), is that there also exists a time lag between the firm's expenditure in innovation and its output. Thus, we further take the two-year forward value of innovation output measurements, (PA_{t+2}) and (PG_{t+2}). We present the results in Panel B of Table 5. Consistent with the baseline findings, the coefficients of managerial myopia (Myopia) are still negative and statistically significant at the 1% level, which indicates our baseline results are robust. We also add province fixed effects and rerun this regression, and the coefficients of Myopia remain significantly negative at the 1% level.[4]

4.5.3. Removing Big Cities

As there are development and resource allocation differences, key cities with well-developed economies often face more competitive markets and innovation intentions. For example, Beijing-based firms may have greater access to subsidies according to Boeing (2016), while firms located in Shanghai and Shenzhen may have greater access to financial markets and private funds (e.g., Huang et al., 2020), all of which would allow for the increased financing of innovation activities.

Therefore, it is necessary to test the impact of myopia and innovation excluding key cities. Four municipalities directly under the central government, 22 provincial capitals, and five cities specifically designated in the state plan[5] are excluded, and the regression results are shown in Table 5 Panel C. The results show that the impact of managerial myopia on innovation is still significantly negative after excluding the corresponding key cities, which indicates that the baseline findings are robust.

4.5.4. Additional Fixed Effects to Alleviate the Problem of Missing Variables

Following J. Zhang et al. (2023), we add the joint effect of industry and year (Industryear) fixed effects, and province (Province) fixed effects. Panel D of Table 5 shows that the coefficients of Myopia are all significantly negative at the 1% level after controlling for the joint effect of industry and year, as well as province fixed effects. Thus, the baseline results remain robust.

4.5.5. Propensity Score Matching

Next, we apply a propensity score matching (PSM) approach (Rosenbaum & Rubin, 1983). Our matching procedure relies on a one-to-one neighbor matching of propensity scores without replacement, which is estimated by a probit regression of the binary dummy variable on a set of firm control variables. The balanced test results are consistent with pairwise comparisons of the covariates on which the matching is performed before and after the matching process (Kong et al., 2020). Specifically, the results show no statistical differences across any of the firm characteristics after the PSM[6], suggesting that firms in the matched sample are comparable. The post-matching results shown in Table 6 indicate that managerial myopia negatively affects innovation.

Table 6. PSM—matched sample regression.

	(1)	(2)	(3)
VARIABLES	**R&D**	**PA**	**PG**
Myopia	−0.016 ***	−1.035 ***	−1.015 ***
	(−5.341)	(−3.923)	(−3.922)
Constant	−0.021	−13.060 ***	−11.888 ***
	(−1.628)	(−12.295)	(−11.545)
Observations	6692	6692	6692
Adjusted R^2	0.345	0.413	0.418
Control	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

This table reports the results after we rerun the baseline regression using the matched sample. The balanced test results after matching are reported in the Table A2. All variables are defined in Appendix A Table A1. The *t*-statistics in parentheses are calculated from the robust standard errors clustered at the firm level. The symbols ***, **, and * denote significance level at the 1%, 5%, and 10% levels, respectively.

4.5.6. Endogeneity—2SLS

Our baseline results may be affected by endogeneity issues. First, potential omitted variables may affect both managerial myopia behavior and firm innovation. Second,

causality problems may exist. To address these issues, we use an instrumental variable (IV) and a two-stage least square (2SLS) regression to reproduce the baseline estimation. Research shows that gambling preferences affect the personal decision making regarding equity options, stock trading, as well as management decisions (Byun & Kim, 2016; Yao et al., 2019). According to Y. Chen et al. (2014), managers from regions where gambling activities are more acceptable and universal care more about short-term returns and profits. The gambling preferences of a district reveal managerial opportunism (Sheng et al., 2022), as local attitudes towards gambling may encourage managers to act speculatively by making short-term decisions and avoiding long-term investment. Building on this literature, we posit that stronger local gambling preferences foster managerial short-term orientation, encouraging speculative, myopic decision-making at the expense of long-term value creation. In addition, lottery sales are determined by regional cultural preferences and household consumption behavior rather than firm-specific innovation strategies or performance (Sheng et al., 2022). It is therefore unlikely that lottery sales affect firm innovation outcomes except through their influence on managerial cognition and time horizons, satisfying the exclusion restriction.

We employ the instrumental variable Lottery, which is the total welfare lottery sales scaled by the GDP of a given year and province, following Ji et al. (2021), as the measure of provincial-level gambling preference. The lottery sales information is obtained from the National Bureau of Statistics of China.

We first regress the index of managerial myopia (Myopia) on our instrumental variable (Lottery). As expected, Lottery is positively related to the Myopia index, and the coefficients are statistically significant at the 5% level. The results are presented in Table 7, which shows that regional gambling preference encourages opportunism behavior and causes the short-termism of firm managers. The first stage F statistics is 14.098, which are larger than the critical value of ten suggested by Staiger and Stock (1994), indicating that our instrumental variable is not weak. The second stage results are shown in Columns (2) to (4) of Table 7. We use both industry-year fixed effects, following Sheng et al. (2022). The coefficients of Myopia all remain significantly negative, which is consistent with the baseline results.[7] Overall, our 2SLS IV analysis results support our baseline finding that managerial myopia reduces corporate innovation.

Table 7. 2SLS—IV regression.

	First Stage	Second Stage		
	(1)	(2)	(3)	(4)
VARIABLES	MP	R&D	PA	PG
Lottery	4.191 **			
	(2.311)			
Myopia		−0.334 ***	−28.244 ***	−29.137 ***
		(−3.298)	(−3.232)	(−3.295)
Constant	−0.206 ***	−0.096 ***	−19.776 ***	−18.827 ***
	(−3.441)	(−4.054)	(−9.589)	(−9.067)
Observations	8944	8944	8944	8944
Adjusted R^2	0.138	−1.596	−1.443	−1.764
Control	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
F-value	14.859			

This table reports the results of the 2SLS regression with instrumental variable. The instrumental variable is the total welfare lottery sales scaled by GDP in the province. All the variables are defined in Appendix A Table A1. The *t*-statistics in parentheses are calculated from the robust standard errors clustered at the firm level. The symbols ***, **, and * denote a significance level at the 1%, 5%, and 10% levels, respectively.

5. Further Analysis

5.1. Impact of Myopia and Innovation on Firm Growth

Firm innovation has long been recognized as one of the key embodiments of firms' sustainable competitiveness, and firm growth and survival (Chuluun et al., 2017; Kogan et al., 2017). Previous tests support our hypothesis 1 that myopia negatively affects innovation decision and hampers innovation performance, and consequently it is worthwhile investigating whether reduced innovation will weaken the firm's growth prospects. Following Z. Fan et al. (2024), we use Tobin's Q as the explained variable. We interact with the myopia index (Myopia) and R&D investment (R&D), taking the interaction term (Myopia × R&D) as the main explanatory variable. The test results in Table 8 show that the coefficients of interaction term are negative, and the coefficients are significant for the two- and three-year forward values of Tobin's Q. This result demonstrates that managerial myopia weakens the positive impact of corporate innovation on firm growth and the value of the company, although this damage is not immediate, and instead there is a lagged effect before it becomes significant. We further test the interaction term Myopia × Patent, and find a positive but statistically insignificant relationship with Tobin's Q. This result suggests that although myopic managers may still generate patent output, such innovation is likely short-sighted, inefficient, or poorly aligned with long-term firm strategy. Consequently, even when innovation outputs exist, the market does not reward these firms with higher growth valuations.

Table 8. Managerial myopia and innovation impact on firm growth opportunities.

	(1)	(2)	(3)	(4)
VARIABLES	**Tobin's Q**	**Tobin's Q_{t+1}**	**Tobin's Q_{t+2}**	**Tobin's Q_{t+3}**
Myopia × R&D	−10.364	−14.849	−31.667 *	−36.221 *
	(−0.632)	(−0.903)	(−1.762)	(−1.895)
Myopia	0.216	0.416	0.637 **	0.925 ***
	(0.732)	(1.371)	(1.978)	(2.700)
R&D	12.327 ***	11.486 ***	13.267 ***	15.425 ***
	(5.127)	(4.433)	(4.535)	(4.414)
Constant	10.589 ***	7.245 ***	5.025 ***	3.765 ***
	(12.225)	(7.491)	(4.988)	(3.505)
Observations	8944	6301	4859	3471
Adjusted R^2	0.404	0.313	0.255	0.250
Control	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Table 8 investigates whether the negative impact of myopia on firm innovation weakens firm growth prospects in the long run. We take Tobin's Q as the explained variable. All the variables are defined in Appendix A Table A1. The *t*-statistics in parentheses are calculated from the robust standard errors clustered at the firm level. The symbols ***, **, and * denote a significance level at the 1%, 5%, and 10% levels, respectively.

5.2. The Moderating Role of Government Ownership

The negative relationship between myopia and firm innovation is evident when myopia is proxied using a textual mining approach. Given the importance of innovation to Chinese sustainable growth and long-term goals, whether the Chinese government prevents mangers' short-sighted behaviors is worthwhile investigating. To explore hypothesis 2, we investigate the moderating effects of the government into two aspects, which are the role of government ownership and of strategic policies. More specifically, we divide our sample into SOE and non-SOE firms, and the results are shown in Panel A of Table 9. We find in non-SOEs that the negative impact of myopia on all our innovation measures is significantly negative, at 1%. While myopia is negatively related to the innovation in-

put measure at the 10% level for SOEs, and it is less economically significant.[8] Furthermore, the negative impact on our innovation output measures is totally muted, indicating that state ownership effectively moderates the negative impact of managerial myopia on firm innovation.

Table 9. The merits of government ownership and policy.

Panel A. SOE and Non-SOE						
	SOE			**Non-SOE**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
VARIABLES	**R&D**	**PA**	**PG**	**R&D**	**PA**	**PG**
Myopia	−0.009 *	−0.450	−0.401	−0.017 ***	−1.233 ***	−1.103 ***
	(−1.927)	(−1.336)	(−1.255)	(−4.624)	(−3.816)	(−3.392)
Constant	0.025	−13.766 ***	−13.488 ***	−0.039 **	−12.408 ***	10.724 ***
	(1.343)	(−7.375)	(−7.462)	(−2.489)	(−10.213)	(−9.145)
Observations	3151	3151	3151	5793	5793	5793
Adjusted R^2	0.395	0.491	0.493	0.384	0.354	0.365
Control	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Panel B. Central SOE and Local SOE						
	Central SOE			**Local SOE**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
VARIABLES	**R&D**	**PA**	**PG**	**R&D**	**PA**	**PG**
Myopia	−0.009	0.003	−0.105	−0.008 *	−0.756 *	−0.654 *
	(−1.466)	(0.007)	(−0.209)	(−1.912)	(−1.799)	(−1.723)
Constant	−0.003	−12.570 ***	−12.370 ***	0.037	−14.409 ***	−14.455 ***
	(−0.068)	(−3.816)	(−3.941)	(1.528)	(−6.299)	(−6.465)
Observations	1208	1208	1208	1943	1943	1943
Adjusted R^2	0.433	0.538	0.540	0.360	0.473	0.477
Control	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Panel C. Strategic Industry						
	Strategic Industry			**Non-Strategic Industry**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
VARIABLES	**R&D**	**PA**	**PG**	**R&D**	**PA**	**PG**
Myopia	−0.009	−1.138	−1.138	−0.014 ***	−0.890 ***	−0.770 ***
	(−1.267)	(−1.586)	(−2.085)	(−4.885)	(−3.492)	(−3.071)
Constant	−0.087 *	−19.759 ***	−16.171 ***	−0.016	−12.704 ***	−11.905 ***
	(−1.805)	(−5.088)	(−6.335)	(−1.304)	(−12.100)	(−11.646)
Observations	1408	1408	1408	7536	7536	7536
Adjusted R^2	0.559	0.269	0.273	0.297	0.427	0.430
Control	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 9 presents the moderating role of government on myopia and innovation. We consider two aspects, which are government ownership and policies. We divide our sample into SOE and non-SOE, and central SOE and local SOE, as well as whether the firm belongs to the strategic industry. All the variables are defined in Appendix A Table A1. The *t*-statistics in parentheses are calculated from the robust standard errors clustered at the firm level. The symbols ***, **, and * denote a significance level at the 1%, 5%, and 10% levels, respectively.

Normally, central government SOEs are more politically driven, and have stronger government involvement and monitoring (Xie et al., 2019). Thus, we further divide our sample into central SOEs and local SOEs and anticipate that the moderating effect will be more pronounced in central SOEs. As shown in Panel B of Table 9, the negative impact of myopia on innovation performance is only significant in local SOEs. Even though the impact of managerial myopia exists in local SOEs, the impact is still less statistically and economically significant compared with results from full sample regression. Moreover, firms belonging to central government ownership avoid the adverse effects of short-sightedness of managers.

As argued earlier, innovation investment is partially driven by the government concern of long-term economic growth. Therefore, we expect that companies bearing greater government policy priorities and support should experience a lower impact of myopia on innovation. To support our hypothesis, we separate the full sample into the subsample of strategic and non-strategic industries. Strategic industries are defined to include mining, electric power, heat, gas and water, transportation, telecommunications and information technology, and scientific research and services, as in Boubakri et al. (2005) and Li and Yamada (2015), among others. According to Panel C of Table 9, myopia significantly reduces firm innovation only in the non-strategic industries subsample. The results highlight that the mediating effect is more pronounced in firms which are in line with government influence through objectives and policy preferences.

To sum up, the results from heterogeneity analysis shown in Table 9 support our hypothesis 2 that government intervention has a moderating role on managerial myopia behavior.

5.3. The Moderating Effect of Corporate Governance

Corporate governance can monitor and moderate managerial myopia (e.g., Hu et al., 2021; Z. Fan et al., 2024). Z. Fan et al. (2024) find that higher corporate governance inhibits the negative impact of myopia on ESG performance. Hu et al. (2021) reveal that the negative impact of myopia on capital expenditure could also be moderated by corporate governance.

First, we argue that institutional investors have a monitoring and inhibiting effect on management's short-sighted behavior. Unlike individual investors, institutional investors have large capital and strong expertise, and have a strong value investment philosophy, which is motivated by acquiring the long-term value of the firm rather than focusing only on the short-term performance of the firm (Jiang & Yuan, 2018). In addition, institutional investors can implement their investment objectives into the production and operational behaviors of firms through their influence on the management team, thus promoting long-term investment behaviors (Z. Fan et al., 2024). Aghion et al. (2013) find a positive relation between R&D expenditures and the fraction of shares owned by institutional investors. Jiang and Yuan (2018) find that institutional investors promote corporate innovation through site visits to firms. Therefore, we expect that institutional investors can effectively monitor management, inhibit managerial myopia behavior, and promote firms' attention and investment in R&D and innovation. Considering the potential effect, we add the term of institutional investors (Institution) in the model and interact it with the Myopia variable. According to the results presented in Panel A of Table 10, there is positive relation between the interaction term and firm innovation measurements. The results highlight that institutional investor external monitoring role effectively inhibits the negative impact of management myopia on firm innovation.[9]

Table 10. The moderating role of external governance.

Panel A. Institutional Investors			
	(1)	**(2)**	**(3)**
VARIABLES	**R&D**	**PA**	**PG**
Myopia × Institution	0.013	2.525 ***	2.042 **
	(1.193)	(2.832)	(2.242)
Myopia	−0.018 ***	−2.029 ***	−1.706 ***
	(−3.437)	(−4.702)	(−3.976)
Institution	−0.004 **	−0.465 ***	−0.478 ***
	(−2.012)	(−2.719)	(−2.860)
Constant	−0.029 **	−13.590 ***	−12.622 ***
	(−2.330)	(−13.175)	(−12.851)
Observations	8944	8944	8944
Adjusted R^2	0.389	0.411	0.419
Control	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Panel B. Auditors Monitoring			
	(1)	**(2)**	**(3)**
VARIABLES	**R&D**	**PA**	**PG**
Myopia × Big 4	0.008	2.277 **	2.442 ***
	(0.886)	(2.563)	(2.806)
Myopia	−0.013 ***	−1.069 ***	−0.982 ***
	(−4.794)	(−4.401)	(−4.147)
Big4	−0.001	−0.636 ***	−0.563 ***
	(−0.710)	(−3.049)	(−2.855)
Constant	−0.025 **	−14.116 ***	−12.744 ***
	(−2.013)	(−13.846)	(−12.938)
Observations	8944	8944	8944
Adjusted R^2	0.388	0.412	0.419
Control	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Table 10 reports the moderating tests of good external governance effect on myopia and innovation. The moderators are institutional investors (Institution) and auditors' monitoring (Big 4). All the variables are defined in Appendix A Table A1. The *t*-statistics in parentheses are calculated from the robust standard errors clustered at the firm level. The symbols ***, **, and * denote a significance level at the 1%, 5%, and 10% levels, respectively.

Previous research suggests that audit quality can help firms raise equity more frequently with larger issues (X. Chang et al., 2009), lower the cost of debt (Mansi et al., 2004), and increase firm innovation performance by reducing the moral hazard costs of innovation investment (Nguyen et al., 2020). Moreover, audit quality constrains managers' opportunistic behavior (Lobo et al., 2018), since a high quality of audit work mitigates information opacity and agency problems (Reichelt & Wang, 2010). Therefore, we expect audit quality to reduce the negative impact of short-sightedness on R&D and innovation performance. Following previous studies (Che et al., 2020), we introduce the dummy variable for the top four international audit firms (Big 4) as a proxy of auditor quality. This dummy variable equals one if a firm is audited by Big 4 audit firms, and zero otherwise. Panel B of Table 10 presents the results after we interact with the Big 4 and Myopia variables. As predicted, we find that the negative relationship between managerial myopia and innovation is weakened when the audit quality is high. In addition, we observe that auditors' monitoring contributes to better patent application and grant.

Moreover, corporate internal governance also matters. The structure of the board affects firm decisions and performance (Allen et al., 2005). Evidence shows that firms in China rely heavily on board members to access capital and improve market competitiveness (Sun & Zou, 2021). Balsmeier et al. (201) suggest that independent directors have positive impact in terms of reducing agency costs and improving firm governance. They find that companies transitioning to independent boards are more focused on technology and long-term development. These companies file more patents and receive more citations. Consistent with these studies, we argue that boards with more independent directors enhance firm governance and reduce the extent to which managers exhibit myopia-related behavior. To test our hypothesis, we introduce the interaction term between board independence (Independence) and myopia index (Myopia), and the result in the Panel A of Table 11. It reveals that the negative impact is missing, indicating that independence board directors ease the tension of managerial myopia on innovation.

Table 11. The moderating role of internal governance.

Panel A. Independent Directors			
	(1)	**(2)**	**(3)**
VARIABLES	**R&D**	**PA**	**PG**
Myopia × Independence	−0.077	0.162	−0.405
	(−1.597)	(0.038)	(−0.100)
Myopia	0.016	−0.999	−0.679
	(0.872)	(−0.621)	(−0.444)
Independence	0.025 **	−0.081	0.059
	(2.568)	(−0.102)	(0.081)
Constant	−0.028 **	−13.462 ***	−12.333 ***
	(−2.234)	(−13.190)	(−12.562)
Observations	8944	8944	8944
Adjusted R^2	0.389	0.410	0.417
Control	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Panel B. Female Ratio in Board			
	(1)	**(2)**	**(3)**
VARIABLES	**R&D**	**PA**	**PG**
Myopia × Board diversity	0.016	0.139	−0.281
	(0.876)	(0.083)	(−0.173)
Myopia	−0.015 ***	−0.954 ***	−0.786 **
	(−3.862)	(−2.843)	(−2.472)
Female CEO	−0.005	−0.175	−0.073
	(−1.432)	(−0.685)	(−0.300)
Constant	−0.023 *	−13.383 ***	−12.261 ***
	(−1.889)	(−13.475)	(−12.816)
Observations	8944	8944	8944
Adjusted R^2	0.389	0.410	0.417
Control	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Table 11 reports the moderating tests of good internal corporate governance effect on myopia and innovation. The moderators are board independence (Independence) and the female ratio of board members (Board diversity). All the variables are defined in Appendix A Table A1. The *t*-statistics in parentheses are calculated from the robust standard errors clustered at the firm level. The symbols ***, **, and * denote a significance level at the 1%, 5%, and 10% levels, respectively.

Additionally, gender may also be important. Zeng and Wu (2012) find that female executives in China have a positive impact on corporate innovation. Furthermore, Tate and Yang (2015) suggest that having women in leadership can have important externalities and improve team efficiency, while Y. Liu et al. (2014) find that female CFOs engage in less earning manipulation and have a higher quality of financial reporting. This literature supports the existence of gender differences between male and female executives in making corporate decisions. Typically, women are less overconfident (Gao et al., 2016). We interact the female ratio of board members (Board diversity) and the managerial myopia index and rerun the baseline regression. The results are reported in Panel B of Table 11, which shows that the negative impact of myopia on R&D expenditure and patent is offset.

Overall, Tables 10 and 11 reveals that both external and internal corporate governance plays a moderating role in the negative relationship between managerial myopia and innovation, which supports our hypothesis 3. More importantly, by comparing the results in Tables 10 and 11, we find that the role of governance from outside the firm is more effective than corporate internal factors.

6. Conclusions

Innovation is the key to firms' sustainable development. Management is the leading decision maker in companies and plays a significant role in the innovation process. Following the time orientation theory in psychology, this paper focuses on the short-termism behaviors of management, namely, managerial myopia, and its impact on firm innovation. We introduce a recent text mining approach to proxy myopia, and we capture the significant negative relationship between managerial myopia and firm R&D expenditure, patent output, patent quality, and innovation efficiency. The results are robust after several model specifications and endogeneity checks. Moreover, we find this negative relationship would further harm the company's future growth prospects in the long run. Further analyses reveal that government ownership, political support, and good corporate governance greatly inhibit the negative effects of management short-sightedness.

Our findings shed light on the importance of managerial myopia in corporate innovation decisions and performance. We also capture the potential advantage of government ownership in terms of management decision making at the firm level, which is of interest to both policymakers and investors.

For future studies, we highlight green innovation as an important avenue. Green innovation typically involves longer investment horizons and greater uncertainty, making it particularly sensitive to managerial time orientation and myopic behavior (X. Liu, 2022). Due to data limitations, especially the lack of consistent firm-level green patent classifications over the full sample period, we are unable to examine this issue empirically. Future studies could investigate whether managerial myopia disproportionately constrains green innovation relative to conventional innovation and explore the moderating roles of environmental regulation and ESG pressures in alleviating such effects.

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Appendix A

Table A1. Variable Definitions.

Variables	Definition
R&D	R&D expenditure scaled by total assets.
PA	The natural logarithm of one plus the number of patent applications in a year.
PG	The natural logarithm of one plus the number of patent grants in a year.
MP	Myopia, number of short-term keywords divided by total words multiplied by 100 in the section of management discussion and analysis (MD&A) in the annual reports.
Firm Size	The natural logarithm of total assets of a firm.
Leverage	Total debt divided by total assets.
Firm Age	The natural logarithm of listing age of a firm.
Tobin's Q	The ratio of market value and book value of total assets.
ROA	The net income divided by total assets.
Cash Ratio	The ratio of cash and tradable securities to total assets.
Subsidy	Government subsidies to firms divided by total assets.
SOE	Dummy variable equal to one if the firm is state-owned, and zero otherwise.
Independence	The number of independent directors as a percentage of the total number of directors on the board.
Board Size	The natural logarithm of the total number of directors on the board.
Concentration	Top one shareholding, which is the largest shareholding.
CEO Age	The natural logarithm of CEOs' age.
CEO Tenure	Tenure of CEO.
CEO Gender	Dummy variable equal to one if the CEO is male, and zero if the CEO is female.
CEO Education	A five-point scale reflecting the highest levels of education attained (1 = below college degree, 2 = college degree, 3 = undergraduate degree, 4 = master's degree, and 5 = Ph.D. degree)
CEO Duality	Dummy variable equal to one if the CEO also serves as the chairman, and zero otherwise.
Gpay	The natural logarithm of the compensation of the company's top three highest-paid executives.
GDP Growth	The annual GDP growth rate in a province during the fiscal year.
Efficiency	Innovation efficiency, calculated as the natural logarithm of one plus the number of patent applications divided by the natural logarithm of one plus R&D expenditure, following Quan and Yin (2017).
Lottery	An indicator of provincial-level gambling preference. It is calculated as the total welfare lottery sales scaled by GDP in the province in a year, following Sheng et al. (2022).
Institution	The number of shares held by institutional investors over the total number of shares.
Big 4	An indicator variable for auditor quality. It equals one if a firm is audited by Big 4 audit firms, and zero otherwise.
Board Diversity	Measured by the female ratio among board members.

Table A2. Balanced tests after PSM.

Variable	Sample	Treated	Control	%Bias	Bias	t-Statistics	$p > t$
Firm Size	Unmatched	22.702	22.305	32.8		15.50	0.000
	Matched	22.436	22.453	−1.4	95.9	−0.58	0.564
Leverage	Unmatched	0.461	0.403	29.7		14.04	0.000
	Matched	0.426	0.429	−1.5	95.0	−0.62	0.532
Firm Age	Unmatched	3.010	2.970	15.9		7.52	0.000
	Matched	2.998	2.996	0.7	95.8	0.28	0.781
Tobin's Q	Unmatched	1.984	2.258	−19.5		−9.22	0.000
	Matched	2.131	2.138	−0.5	97.3	−0.22	0.826
ROA	Unmatched	0.027	0.036	−11.7		−5.54	0.000
	Matched	0.033	0.032	1.5	87.6	0.60	0.548
Cash Ratio	Unmatched	0.131	0.148	−16.6		−7.85	0.000
	Matched	0.138	0.136	2.0	88.0	0.84	0.403
Subsidy	Unmatched	0.004	0.005	−7.8		−3.67	0.000
	Matched	0.005	0.005	0.3	95.5	0.14	0.887
SOE	Unmatched	0.457	0.249	44.6		21.12	0.000
	Matched	0.316	0.322	−1.3	97.1	−0.52	0.600
Independence	Unmatched	0.374	0.377	−5.4		−2.56	0.011
	Matched	0.374	0.375	−1.5	72.8	−0.61	0.541
Board Size	Unmatched	2.147	2.107	20.3		9.61	0.000
	Matched	2.124	2.123	0.3	98.5	0.13	0.896
Concentration	Unmatched	0.343	0.311	23.4		11.07	0.000
	Matched	0.321	0.324	−2.0	91.4	−0.85	0.397
CEO Age	Unmatched	3.902	3.882	14.2		6.70	0.000
	Matched	3.891	3.891	−0.6	96.0	−0.23	0.816
CEO Tenure	Unmatched	4.834	4.876	−1.2		−0.55	0.581
	Matched	4.873	4.918	−1.3	−7.8	−0.52	0.604
CEO Gender	Unmatched	0.948	0.925	9.6		4.54	0.000
	Matched	0.935	0.935	−0.4	96.2	−0.15	0.882
CEO Education	Unmatched	3.210	3.107	8.1		3.81	0.000
	Matched	3.107	3.123	−1.2	85.2	−0.48	0.629
CEO Duality	Unmatched	0.204	0.309	−24.2		−11.43	0.000
	Matched	0.250	0.254	−1.0	95.7	−0.42	0.673
Gpay	Unmatched	14.537	14.528	1.2		0.59	0.555
	Matched	14.533	14.535	−0.3	74.0	−0.13	0.895
GDP Growth	Unmatched	0.073	0.077	−7.7		−3.63	0.000
	Matched	0.075	0.075	−0.3	95.9	−0.13	0.896

This table reports the balanced test result after matching. Our matching procedure relies on a one-to-one nearest neighbor matching of propensity scores without replacement, which are estimated by a probit regression. All the variables are defined in Table A1.

Table A3. List of short-termism words.

Myopia Words					
Time (28)	尽快	尽早	早日	抓紧	及早
	as soon as possible	as early as possible	early	make the most of	at the earliest time
	力争	全力	立即	加紧	数月
	strive	fully	immediately	speed up	several months
	年内	立刻	马上	日内	数天
	within a year	at once	right away	within a day	several days
	随即	即刻	在即	最晚	最迟
	immediately	instantly	imminent	late	no later than
	关头	恰逢	来临之际	前夕	适逢

Table A3. *Cont.*

	Myopia Words				
	critical moment	coincide with	approaching	the day before	just happened to
	遇上	正逢	之时		
	encounter	just in time for	at the time of		
Pressure (9)	契机	之际	压力	考验	难度
	opportunity	at the point of	pressure	test	difficulty
	困境	严峻考验	双重压力	通胀压力	
	dilemma	severe test	double stress	inflation pressure	

Notes

1 The previous literature explores several approaches to proxy the short-termism behavior in the management team, such as questionnaire (Marginson & McAulay, 2008) and horizon analysis using the ratio of firms' short-term investment (Fang & Jin, 2016). The shortcomings of these methods have been fully discussed in the previous literature (e.g., H. Liu & Zhang, 2023; Hu et al., 2021). The management executives are busy people with heavy workloads as well as career concerns; thus, the response rate of questionnaires may be low and may be prone to subjective bias (C. Chen et al., 2023). The horizon analysis by Fang and Jin (2016) observes managers' ex post facto and perceptions, not what they really feel at the time.

2 Management discussion and analysis (MD&A) is a section within a listed company's annual report where executives investigate firm performance. It includes various discussions of decisions, risks, future goals, and new projects.

3 We thank the anonymous reviewer for raising this question.

4 The results are available on request.

5 The city specifically designated in the State Plan include Shenzhen, Dalian, Qingdao, Ningbo, and Xiamen.

6 Balanced tests results after PSM are reported in Appendix A Table A2.

7 We find the negative adjusted R^2 observed in the second stage of the 2SLS regression. We clarify that a negative adjusted R^2 can arise in IV estimations, especially when the second-stage regression focuses on causal identification rather than goodness-of-fit. Unlike OLS, 2SLS does not aim to maximize explanatory power; instead, it prioritizes the consistent estimation of causal effects. According to the Stata structure of IV estimation (https://www.stata.com/statalist/archive/2011-10/msg00993.html (accessed on 8 January 2026)), the presence of a negative adjusted R^2 does not invalidate the IV estimates, particularly when the first-stage results confirm instrument relevance and standard diagnostic tests support instrument validity.

8 In the SOE subsample of Table 9, Panel A, the economic significance of myopia is −0.051, and −0.061 in non-SOE subsample

9 Regarding the interaction analysis in Table 10, we clarify that our focus is on the coefficient of the interaction term (Myopia × moderating variable) rather than the individual main effects. This approach is methodologically appropriate because the interaction term captures the incremental moderating effect, which is the core research interest. The coefficients of Myopia and the moderating variable represent conditional effects when the interacting variable equals zero, which may not have meaningful economic interpretation in the setting. This practice is consistent with standard econometric treatment of interaction models in corporate finance and innovation research (e.g., L. Wang et al., 2021).

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