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Managerial myopia and biodiversity alignment- evidence from China

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ABSTRACT

The preservation of biodiversity is a critical global issue intrinsically linked to humanity's future. Despite its importance, research examining the intersection of corporate management and biodiversity practices remains scarce. This study addresses this gap by investigating the influence of managerial myopia on corporate biodiversity performance. Using a dataset of 952 A-share listed companies in China from 2015 to 2022, our empirical analysis reveals that a one-unit reduction in managerial myopia corresponds to a 0.83 % improvement in biodiversity outcomes. These findings are robust, as confirmed through comprehensive sensitivity analyses. Furthermore, we identify several factors that significantly influence this relationship: the stringency of environmental regulations, resource reliability, market competition, and innovation. Notably, managerial myopia not only undermines a firm's short-term profitability but also impairs its capacity for long-term value creation by hindering its biodiversity performance.

1. Introduction

In recent years, the interaction of environmental degradation, climate issues, and species crises has become increasingly obvious in its impact on normal human production and life (Carvalho, Cojoianu, & Ascui, 2023). Scholars have begun to critically reassess the challenges posed by “modernity”. (Gray, 2006). Consequently, issues such as sustainable development and biodiversity have captured the attention of the whole society (Huarng & Yu, 2024). In response, the United Nations introduced the concept of sustainable development in 1987 and articulated 17 Sustainable Development Goals in 2015. Notably, to foster biodiversity conservation, the United Nations adopted the Convention on Biological Diversity in 1992. The ‘Kunming-Montreal Global Biodiversity Framework,’ ratified in 2022, offers a comprehensive and pragmatic blueprint for action.

It is also increasingly recognized that the natural environment and resources are vital components of corporate production and operations. As part of society, corporations have an inescapable responsibility to advance sustainable development and biodiversity conservation (Lindblom, 1994). This should not be limited to economic wealth creation but should also contribute to the natural environment. Moreover, a body of opinion believes that corporate stakeholders should include all those covered by its social impact, including the natural environment (Freeman, Dmytriyev, & Phillips, 2021; Zumente & Bistrova, 2021), which provides direct support for companies to enhance biodiversity performance (Coolsaet, Dawson, Rabitz, & Lovera, 2020). This trend has led to the widespread adoption of concepts such as sustainable development, CSR, and ESG in corporate research and practice. However, these concepts are inherently broad, often prioritizing issues such as carbon emissions and pollution management, while biodiversity remains underemphasized (Edmans, 2023). CSR and ESG are predominantly anthropocentric, focusing on how environmental and governance issues impact human welfare and shareholder value. In contrast, biodiversity conservation adopts an ecocentric perspective, emphasizing the intrinsic value of ecosystems and species beyond their economic utility (Kopnina, Zhang, Anthony, Hassan, & Maroun, 2024).

Prior research has highlighted the severe consequences of the overall environmental crisis and its correlation with the property of corporations (Donaldson & Dunfee, 2002), business models (Ringvold, Saebi, & Foss, 2023), value creation (Adams, 2017; Zhang & Lucey, 2022), risk responses (Bassen, Buchholz, Lopatta, & Rudolf, 2024; Xin, Grant, Groom, & Zhang, 2023), and policy responses (White, Mukherjee, Petrovan, & Sutherland, 2023). Studies on biodiversity not only point out that it is one of the most significant risk today(Polasky, Costello, & Solow, 2005), thus possessing urgency (Bassen, Buchholz, Lopatta, & Rudolf, 2024), but also notes its close relationship with economic and

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financial activities. For companies, biodiversity is an unavoidable risk and has an undeniable externality (Aguiar et al., 2023). Companies need to promptly adjust their business models and strategies to cater to this inevitable trend (Smith et al., 2020). Scholars have explored attitudes towards this topic, motivations to enhance biodiversity performance (Carvalho et al., 2023; Smith et al., 2020), influencing factors (Aguiar et al., 2023; Flammer, Giroux, & Heal, 2023; Haque & Jones, 2020), economic consequences (Bassen et al., 2024; Garel, Romec, Sautner, & Wagner, 2023), measurement metrics (Kopnina et al., 2024), governance and improvement (Coolsaet et al., 2020; White et al., 2023; Zu Ermgassen et al., 2022). Despite its importance and urgency, academic attention to corporate biodiversity conservation remains nascent (Hutchinson & Lucey, 2024).

We analyze the potential impact of one aspect of corporate governance, managerial myopia, on biodiversity. This bias may lead managers to prefer short-term benefits in decision-making, which can limit corporate biodiversity performance. We confirm this using data from 952 A-share listed Chinese companies over eight years, and the research conclusions are robust. We conduct text analysis of the MD&A sections in annual reports to extract managerial myopia indicators, obtain corporate biodiversity performance evaluation metrics from the Bloomberg database, and perform regression analysis considering time and industry fixed effects and clustered-robust standard errors. Our study also demonstrates that effective internal and external supervision moderates this process. We also find that stronger environmental regulations and resource reliability mitigate the negative effect of managerial myopia on corporate biodiversity performance, whereas industry competition and innovation intensity exacerbate it. Furthermore, the adverse effects of managerial myopia on biodiversity performance not only undermine current profitability but also create barriers to long-term value creation.

Little research has focused on the internal corporate financial aspects of corporate biodiversity alignment. Short-term cognitive tendencies and behaviors are universal human concerns, while biodiversity conservation represents a pressing issue for all. As the cornerstone of corporate leadership, management plays an indispensable role in pivotal matters, underscoring the importance of examining how managerial decision-making influences biodiversity. Additionally, China is currently navigating a pivotal phase of its economic evolution, referred to as the "new normal".[1] Research on Chinese corporate governance and biodiversity provides essential insights that enrich this field of study (Ding, Jiang, Zhang, & Zhang, 2024). Moreover, this paper builds on prior methods of textual analysis to investigate managerial decision-making, integrating these insights with issues of environmental crises and biodiversity, thus making a significant contribution to the academic discourse. Ultimately, reflecting on John Donne's assertion that "no man is an island," it is clear that both sustainable development and biodiversity are critical concerns that affect the destiny of humanity. It is hoped that this study will further enrich our understanding and support the progression of these vital issues.

The structure of this paper is organized as follows: Section Two includes a review of the literature; Section Three outlines the development of hypotheses; Section Four describes the methodology; Section Five details the sample selection and data description; Section Six presents the explanations and analysis of the main results; Section Seven explores further analysis; Section Eight engages in discussion; and Section Nine concludes the study.

2. Literature review

2.1. Managerial myopia

Managerial myopia describes a bias in the decision-making horizons of management, characterized by both temporal and spatial short-sightedness. Temporal myopia, in particular, refers to a managerial propensity to favor immediate outcomes or benefits in strategic decision-making. This inclination stems from a balancing act between the company's long-term development and short-term operational goals during the decision-making process. It crucially influences the allocation efficiency of corporate resources between immediate operational needs and future growth prospects (Brochet, Loumioti, & Serafeim, 2015; Hu, Xue, & Wang, 2021; Ridge, Kern, & White, 2014). This paper focuses specifically on temporal myopia as a primary aspect of managerial myopia.

There are two primary reasons for managerial myopia. First, temporal orientation and risk preference are inherent aspects of human personality (Carstensen, Isaacowitz, & Charles, 1999; J. Chen & Nadkarni, 2017). Managers may exhibit myopia by favoring immediate benefits or displaying risk aversion (Li, Xu, Zhu, & Haq, 2021), especially under significant life and work pressures (Bluedorn & Martin, 2008). The second reason stems from the self-serving tendencies within principal-agent relationships. Managers, motivated by concerns over-compensation and career trajectories, often opt to maximize current profits or share prices at the expense of the firm's long-term value (Edmans, Fang, & Lewellen, 2017; Stein, 1988). Moreover, the costs incurred by management in long-term projects are not always commensurate with the rewards received, potentially rendering them unable to shoulder the necessary expenses (Aggarwal & Samwick, 2006). Additional pressures from long-term performance expectations (Noe & Rebello, 1997), threats of hostile takeovers or forced dissolutions (Knoeber, 1986), pandering to investors, mismanagement leading to misinformation (Hu et al., 2021) and even the locality effect(Q. Chen, Gao, Niu, Wang, & Wei, 2022) also contribute to inappropriate decision-making horizons. Given the high uncertainty and unpredictable economic returns, biodiversity projects within corporations are likely to be overlooked by myopic managers.

Managerial myopia can have multifaceted and significant impacts (Fan, Chen, & Mo, 2024; Liang & Li, 2024; Lu, Liang, Hu, & Liu, 2024). First, a manager's temporal orientation directly influences their valuation and choices, thus affect their decision and activities of the firm (Ancona, Goodman, Lawrence, & Tushman, 2001) Working process. Styles and innovativeness within the organization will also be impacted (Lin, Shi, Prescott, & Yang, 2019) Secondly, firms are more prone to curtail investments associated with long-term value creation (Hu et al., 2021), such as research and development and innovation investments (J. Chen & Nadkarni, 2017; Li et al., 2021), and advertising expenditures (Brochet et al., 2015). Managerial myopia changes internal investment decisions, impacting performance (Arrfelt, Wiseman, & Hult, 2013) and total factor productivity (Sheng, Guo, & Chang, 2022), thereby diminishing the long-term value of the enterprise (Ding et al., 2024). As a significant strategic component, biodiversity performance determines the long-term interests of the firm, and managerial myopia is highly likely to inhibit such investments.

Indeed, the literature indicates that managerial myopia particularly impedes the fulfillment of corporate social responsibility and the enhancement of ESG-related performance, thus weakening corporate legitimacy. Initially, the temporal orientation of management hampers the firm's ability to fulfill economic, legal obligations, and social responsibilities effectively (Ding et al., 2024), such as illegal emissions of toxic gases (B. Liu, Ju, Bai, & Yu, 2021). Furthermore, a narrow

[1] The term "New Normal" refers to the altered state of affairs in which societies, economies, and ecosystems operate after a significant disruption, such as a global crisis or environmental shift. It encompasses the long-term changes in behaviors, practices, and policies that emerge in response to such events. The relationship between the New Normal and biodiversity is particularly crucial, as biodiversity plays a fundamental role in the resilience and stability of ecosystems. In the context of the New Normal, maintaining or enhancing biodiversity is essential for ensuring that ecosystems can adapt to and recover from ongoing and future changes. Therefore, in the New Normal, biodiversity conservation becomes a key strategy for sustainable development and risk mitigation.

managerial perspective inevitably leads to the neglect of broader stakeholder interests (Fan et al., 2024). Myopic managers are also more likely to obstruct green innovations and undermine information quality (H. Liu & Zhang, 2023; Lu et al., 2024). Being closely related to ESG and CSR, biodiversity is often excluded from the considerations required in managerial decisions, which provides fertile ground for the proliferation of myopic tendencies. Moreover, pressures from the capital markets and product market competition (Ding et al., 2024) intensify this inclination, while the quality of corporate governance and supervisory mechanisms can suppress the implementation of myopic ideas (Brochet et al., 2015; Fan et al., 2024; Lu et al., 2024).

2.2. Corporate biodiversity policy

Biodiversity refers to the richness and variability of biological species within a specific ecosystem or environment. As a critical component of natural capital, biodiversity enhances the ability of ecosystems to regulate themselves, thereby mitigating the threats and disruptions to daily life posed by extreme conditions such as climate change and natural disasters (Carvalho et al., 2023). This not only impacts the economic environment adversely but also has significant implications for social welfare and human well-being (Frank & Sudarshan, 2023).

Current theoretical discussions on biodiversity conservation primarily revolve around three key concepts: legitimacy, stakeholders, and resources. The “legitimacy” and “stakeholder theory” posit that ecosystems and species are integral parts of a firm's stakeholder network (Mitchell, Agle, & Wood, 1997). While firms can benefit from biodiversity conservation, the acquisition of core strategic resources is constrained by the ecological environment in which they operate (Carvalho et al., 2023). Another perspective emphasizes that natural capital is also a vital component of a firm's core strategic resources, significantly influencing long-term value creation (Carvalho et al., 2023). Therefore, firms should actively fulfill their obligations to maintain ecosystems (Jones, 2003) and enhance the transparency of related information (Bassen et al., 2024). Some argue that biodiversity conservation not only entails reducing a firm's negative impact on ecosystems but also requires active promotion and enhancement of the natural environment (Zu Ermgassen et al., 2022).

Biodiversity conservation is crucial for enterprises, offering numerous benefits. Enhancing biodiversity conservation can improve a firm's reputation (Bassen et al., 2024), leading to better financial performance (White et al., 2023), stock returns, and corporate value (Garel et al., 2023; Smith et al., 2020). Moreover, it helps mitigate risks associated with natural capital and the natural environment (Xin et al., 2023) and significantly reduces the likelihood of future stock crashes (Bassen et al., 2024). Environmentally friendly firms typically enjoy higher legitimacy(Flammer et al., 2023; Garel et al., 2023; Karolyi & Tobin-de la Puente, 2023) and are more readily accepted by stakeholders (Hassan, Roberts, & Atkins, 2020). These potential advantages serve as motivation for firms to enhance their biodiversity conservation efforts. Managerial behaviors that suppress biodiversity stem from neglecting these consequences and motivations.

The effectiveness of biodiversity conservation is inextricably linked to corporate governance. First, the capabilities and values of management play a pivotal role. Research indicates that gender diversity on boards enhances a firm's ability to respond to pressures, thereby improving biodiversity performance (Haque & Jones, 2020). Furthermore, due to the inherent complexity of biodiversity information, information asymmetry exists (Boiral, 2016). This issue is exacerbated by false reporting and greenwashing behaviors driven by agency problems within some firms (Benmelech, Kandel, & Veronesi, 2010; Kothari, Shu, & Wysocki, 2009; Pizzi, Caputo, Venturelli, & Caputo, 2022). Effective oversight mechanisms can enhance corporate transparency (Kim, Li, Luo, & Wang, 2020) and facilitate effective communication between firms and stakeholders, thereby alleviating this problem (Bassen et al., 2024). Stakeholder management can directly align corporate capabilities with external demands, thereby enhancing the effectiveness of environmental protection efforts (Aksoy, Buoye, Fors, Keiningham, & Rosengren, 2022; Gond et al., 2018).

Biodiversity conservation is also closely tied to external stakeholders and environmental factors (Coolsaet et al., 2020). The advancement of corporate biodiversity initiatives requires active engagement not only from public investment sectors in promoting sustainable development but also from private investors. Private investment in such projects is often contingent upon financial returns and social impact thresholds (Flammer et al., 2023). Additionally, the focus of capital market participants on green stocks (Pástor, Stambaugh, & Taylor, 2022) and the pressure from public opinion exerted by key stakeholders (Boiral & Heras-Saizarbitoria, 2017) have played positive roles. If short-sighted management hampers biodiversity conservation, it signifies a disregard for the interests of other stakeholders. Moreover, a firm's exposure to environmental risks (Carvalho et al., 2023), reliance on biodiversity (Dasgupta, 2021), and industry characteristics (Carvalho et al., 2023) all influence its responsiveness to this critical issue. Environmental regulation pressures (Bassen et al., 2024) and the local political environment (Coolsaet et al., 2020) also exert pressure on managerial strategic decisions, thereby influencing corporate behavior.

Key literature explores the theoretical underpinnings, causes, and consequences of managerial myopia and biodiversity. Research methodologies encompass theoretical studies and framework development (Carvalho et al., 2023; Coolsaet et al., 2020), interviews (White et al., 2023), case studies (Aguiar et al., 2023; Smith et al., 2020), and empirical research (Bassen et al., 2024; Haque & Jones, 2020).

Key literature related to biodiversity initially emphasizes the philosophical discourse and practical significance underlying this phenomenon, highlighting the necessity and urgency of corporate action. It subsequently offers numerous recommendations for specific implementation strategies by firms. Current research on managerial characteristics has primarily focused on board gender diversity(Haque & Jones, 2020), neglecting other aspects, such as the decision-making horizons explored in this paper. Overall, the implications of biodiversity for corporations remain ambiguous (Carvalho et al., 2023), with a paucity of empirical research (Bassen et al., 2024). This paper significantly contributes to this area.

Research on managerial myopia is relatively more extensive, predominantly concentrating on outcomes such as strategic decision-making and investment efficiency. Recently, scholars in this domain have increasingly focused on the implications for ESG (Environmental, Social, and Governance) and corporate social responsibility. Much of this research examines the deeper mechanisms through the lens of agency relationships and stakeholder oversight. Biodiversity, as a long-term investment and a component of corporate legitimacy, is inevitably influenced by managerial characteristics. Therefore, it is important to explore this topic further. Currently, there is a lack of exploration concerning the intersection of managerial myopia and biodiversity development. This paper addresses these two key themes and investigates the role of external supervision. Additionally, it looks at the heterogeneity of external pressures and their impact on corporate value.

3. Hypothesis development

Enhancing corporate biodiversity performance constitutes a vital component of global biodiversity conservation efforts. Decisions regarding participation in biodiversity policy disclosure and the stance adopted in response to biodiversity risks are critical outcomes of strategic corporate decision-making (Haque & Jones, 2020). Research indicates that managerial myopia, as a form of collective cognition, plays a crucial role in the formulation and execution of strategic decisions within corporations (J. Chen & Nadkarni, 2017).

First, managerial myopia signifies a strategic preference among corporate leaders for projects that yield immediate results and returns, thereby hindering investment in biodiversity. The crisis of species

extinction is an enduring challenge humanity must confront, and addressing such issues constitutes a long-term mandate for companies (Aich, Thakur, Nanda, Tripathy, & Kim, 2021).

Corporate biodiversity conservation is an ongoing commitment throughout a firm's existence, not only because of its lasting impact but also due to its inherently gradual nature. Meaningful ecological outcomes can only be achieved through sustained efforts over extended periods (Carvalho et al., 2023). Although firms might tout biodiversity achievements for instrumental purposes (Edward Freeman, 2010), the fundamental aim of such investments is not wealth creation but the enhancement of current and future human welfare (Evan & Freeman, 1988). Moreover, this activity, driven by moral obligation and legitimacy, remains difficult to quantify in economic terms due to challenges in measurement, valuation methods, and data availability (Bassen et al., 2024; Zu Ermgassen et al., 2022). Consequently, management focused on short-term gains receives minimal immediate feedback from such initiatives.

Second, an aversion to taking substantial risks can also lead to managerial myopia, which in turn suppresses biodiversity efforts (Aghion, Van Reenen, & Zingales, 2013)). This implies that managers are more concerned with project maturity structures and default risks. Viewing biodiversity as an investment that can yield future returns characterizes it by long durations and significant uncertainties (Garel et al., 2023). Currently, biodiversity conservation remains in its nascent stages, lacking mature strategies to address the challenges inherent in project advancement (White et al., 2023). This can result in operational errors and the dissemination of erroneous information that hampers decision-making, along with unforeseen outcomes. As the primary executors of projects, managers may not fully reap the benefits but are often held accountable for any failures (Aggarwal & Samwick, 2006). This mismatch between risks and rewards may lead risk-averse managers to abandon biodiversity projects.

The prevalent principal-agent conflicts offer a compelling rationale for how managerial myopia suppresses biodiversity. Recent studies emphasize that a firm's significant stakeholders extend beyond management and short-term investors focused on arbitrage, encompassing value investors, employees, local communities, governments, media, and the ecological environment (Freeman et al., 2021). Some research even suggests that these stakeholders constitute the broader ownership of firms, implying that managers owe fiduciary duties to them (Freeman & Evan, 1990). Therefore, enhancing biodiversity performance is not merely a means of generating short-term economic value from an instrumental perspective but rather an optimal decision aligned with the demands of diverse stakeholders. Mitigating biodiversity risks and fostering prevention is a strategic necessity for a firm's long-term interests (Aguiar et al., 2023), yet it often lies outside the purview of myopic managers. When conflicts arise between the interests of short-sighted managers and other stakeholders, managers are likely to prioritize their own interests. Furthermore, managers exert direct control over corporate operations and may leverage their authority to influence the arrangement and execution of various corporate activities (Li et al., 2021; Lu et al., 2024). In doing so, myopic managers may impede the advancement of corporate biodiversity performance to serve their own interests.

Based on the foregoing discussion, the following hypothesis is proposed:

H1. Managerial myopia inhibits corporate biodiversity performance.

Supervisory mechanisms can fundamentally mitigate the underlying causes of managerial myopia. First and foremost, these mechanisms represent the oversight and checks and balances exerted by various stakeholders on management. They serve to diminish the influence of individual traits on overall decision-making while also impacting the firm's reputation, ensuring that managers are held accountable for the risks they generate (Lewis, Walls, & Dowell, 2014). Furthermore, these mechanisms enhance transparency and facilitate communication between the firm and its stakeholders (Samans & Nelson, 2022), enabling certain stakeholders to participate directly in the decision-making process. Robust internal and external supervision not only distributes responsibility and shares pressure and costs but also improves the accuracy and standardization of organizational operations, thereby enhancing operational efficiency (Jensen & Meckling, 1976). These factors collectively mitigate the influence of managerial myopia on biodiversity risk management practices.

(1) Analysts: Analysts comprehensively gather, analyze, and compare various facets of corporate information. As crucial sources of information, analyst forecasts and reports provide stakeholders with an objective, neutral, and professional view of a firm's true operational and governance status, encouraging management to enhance the firm's biodiversity performance.
(2) Monitoring Institutional Investors: Following Hu Nan's research, we define monitoring institutional investors as those who can genuinely exercise oversight over a firm. Such investors possess extensive market resources and investment expertise, allowing them to assess corporate decisions from a broader, long-term perspective. As significant investors, they can directly participate in corporate decision-making through activities like shareholder meetings, thereby balancing managerial power. Their stringent exit mechanisms also serve as a deterrent to management, encouraging resource allocation towards biodiversity initiatives.
(3) Media: The media provide timely and comprehensive exposure to events of stakeholder interest. In today's era of advanced information dissemination, this exposure mechanism swiftly and accurately captures stakeholder attention, helping to identify biodiversity risks. This not only enhances corporate transparency but also exerts public pressure on managers, compelling them to consider the desires of a broad range of stakeholders, reduce risks, and increase biodiversity conservation efforts.
(4) Government: On the one hand, governments can guide corporate actions by employing rewards or penalties to encourage compliance. For instance, the Chinese government has implemented various initiatives to promote corporate biodiversity conservation, including environmental protection laws, ecological compensation programs, and government-guided funds. On the other hand, governments often possess superior resources and access to more transparent information, allowing them to provide valuable guidance to businesses. Furthermore, governmental credibility can magnify the repercussions of corporate behavior, as firms under government scrutiny face heightened reputational pressure. Together, these factors position governments as highly effective overseers of corporate efforts to protect biodiversity.
(5) Internal Controls: A comprehensive internal control system offers standardized processes that create mutual constraints within an organization's production and operational activities, ensuring compliance and efficiency. This system delineates management responsibilities and authority, preventing personal traits and inclinations from excessively influencing the organization. Moreover, internal controls ensure effective internal communication, reducing operational or decision-making errors and curbing the adverse effects of myopia.

Based on the above, the following hypotheses are proposed:

H2. The stronger the supervisory mechanisms, the more the negative relationship between managerial myopia and biodiversity performance is mitigated.

H2a. The stronger the analyst oversight, the more effectively the negative relationship between managerial myopia and biodiversity performance is mitigated.

H2b. The stronger the institutional investor oversight, the more effectively the negative relationship between managerial myopia and biodiversity performance is mitigated.

H2c. The stronger the media oversight, the more effectively the negative relationship between managerial myopia and biodiversity performance is mitigated.

H2d. The stronger the government oversight, the more effectively the negative relationship between managerial myopia and biodiversity performance is mitigated.

H2e. The higher the level of internal control, the more effectively the negative relationship between managerial myopia and biodiversity performance is mitigated.

4. Data

Given the United Nations' introduction of the Sustainable Development Goals in 2015, which included detailed action plans for environmental and species diversity conservation, this study selects 2015 as the starting point for the sample period, focusing on all A-share listed companies in China.

Currently, Bloomberg and MSCI are two ESG rating agencies that provide separate biodiversity scores. However, due to data accessibility issues, MSCI scores are not applicable to Chinese companies. Therefore, this study utilizes Bloomberg's Biodiversity Policy score as a proxy variable for corporate biodiversity performance. Bloomberg, an internationally recognized ESG rating agency, derives its information from corporate self-disclosed reports. Its scoring methodology involves constructing a comprehensive rating framework, evaluating various corporate performances, and weighting them according to the impact of each sub-theme to derive the overall ESG score. Specifically, “Ecological & Biodiversity Impacts” is a critical component of the environmental score, with the Biodiversity Policy being a key evaluation criterion, indicating whether a company implements policies favorable to biodiversity. If a company discloses a biodiversity policy, the biodiversity policy index is assigned a value of 1; if not, the index is assigned a value of 0. It is important to note that our biodiversity policy indicator reflects corporate disclosure practices rather than ecological outcomes. This limitation is inherent in the reliance on self-reported ESG data. While we recognize the need for more robust biodiversity performance metrics, the absence of such alternatives—especially for Chinese firms—poses a challenge. As a result, our analysis focuses on the degree of corporate attention to biodiversity, as indicated by voluntary disclosures.

Following (Hu et al., 2021) we construct a managerial myopia index. Specifically, we extract and segment the MD&A sections of annual reports from listed companies to identify terms that reflect managerial temporal orientation, such as “within days,” “several months,” “within the year,” “as soon as possible,” “immediately,” “instantly,” “opportunity,” “moment,” “pressure,” and “test.” We calculate the proportion of these terms relative to the total word frequency in the MD&A, then multiply by 100 to derive an index of managerial temporal orientation. Hu et al. have validated the effectiveness of this index from both temporal and spatial dimensions. They conducted extensive temporal analyses and compared the index with actual outcomes and prior studies to bolster the credibility of their conclusions. For example, they demonstrated the significant relationship between the $MM_{i,t}$ index and both discretionary and real earnings management activities, establishing $MM_{i,t}$ as a valid measure of managerial myopia (Hu et al., 2021).

Following prior research (Brochet et al., 2015; J. Chen & Nadkarni, 2017), this study selects the following variables as controls: $Size_{i,t}$ (number of employees), $Transparency_{i,t}$ (three-year moving average of the absolute value of discretionary accruals), $Leverage_{i,t}$ (debt-to-asset ratio), $Liquidity_{i,t}$ (current ratio), $PPE_{i,t}$ (total fixed assets), $SOE_{i,t}$ (state-owned enterprise status), $Cycle_{i,t}$ (operating cycle, defined as the sum of inventory turnover days and accounts receivable turnover days) and $Cash_{i,t}$ (cash ratio).

The financial data for this study are sourced from the CSMAR database. The sample selection criteria are as follows: (1) The sample must include all necessary dependent, independent, and control variables, as well as variables required for the mechanism analysis; (2) Due to the unique characteristics of China's financial and real estate sectors, firms from these industries are excluded from the sample; (3) Companies that are either about to be delisted or have already been delisted (ST/PT) are also excluded.

All regression data are standardized to achieve a standard normal distribution with a mean of 0 and a standard deviation of 1. This standardization eliminates incomparability due to unit differences between data points and allows the study's findings to be more economically significant by measuring effects in terms of standard deviations rather than means. To mitigate the influence of outliers, all continuous variables are winsorized at the 1 % and 99 % levels. Our final sample includes 5835 observations derived from 952 firms over an eight-year period (2015–2022).

Table 1 presents the descriptive statistics for the main variables, including the mean, standard deviation, minimum, 25th percentile, median, 75th percentile, and maximum values for each variable. The maximum value for corporate biodiversity performance is 1, with a minimum of 0 and a mean of 0.074, indicating that most sampled companies do not implement biodiversity policies, and overall, corporate biodiversity performance in China is relatively weak. Our sample spans the years 2015 to 2022. In 2015, 32 companies disclosed a biodiversity policy (biodiversity policy index = 1), while the remaining companies did not (index = 0). Over time, the proportion of companies disclosing biodiversity policies has steadily increased, with 122 companies reporting such policies by 2022. This upward trend highlights the growing recognition of biodiversity issues among listed firms in China. The maximum value for managerial myopia is 0.445, with a minimum of 0.000 and a mean of 0.114, suggesting significant variation in managerial myopia across firms. The distribution of other control variables aligns with existing literature. Table 2 presents the correlation analysis of the main variables.

We employ the following base model to examine the impact of managerial myopia on corporate biodiversity performance:

$$Biodiv_{i,t} = \beta_0 + \beta_1 MM_{i,t} + \gamma' Controls + \delta_{ind} + \theta_t + \varepsilon_{i,t} \quad (1)$$

In this model, $Biodiv_{i,t}$ represents the biodiversity performance of firm i in year t, specifically the disclosure status of biodiversity policies for that year. The explanatory variable is the degree of managerial myopia $MM_{i,t}$ for firm i in year t. $X_{i,t}$ denotes a set of control variables. Additionally, industry fixed effects δ_{ind} and year fixed effects θ_t are incorporated into the empirical analysis. The model accounts for clustered robust standard errors.

To mitigate potential adverse effects of endogeneity on our results, we employ the two-stage least squares (2SLS) and system generalized method of moments (GMM) approaches to address potential bias arising from omitted variables and reverse causality. These methods incorporate instrumental variables to effectively manage these issues. We also utilized the GMM model to deal with issues related to endogeneity, autocorrelation, and unobserved heterogeneity in dynamic panel data models. Additionally, to resolve sample selection bias, we utilize the Heckman two-stage treatment effect model. Recognizing the potential mutual influence between $Biodiv_{i,t}$ and $MM_{i,t}$ within the same period, we finally construct a simultaneous equation model (SEM) based on the three-stage least squares (3SLS) method to examine this issue, employing a two-stage residual inclusion approach to control for the effects of other variables. To derive more generalizable conclusions, we exclude data from the pandemic period in our regressions. We will elaborate on these methods in the robustness checks section.

Table 1
Descriptive statistics.

Variable	Mean	SD	Min	p25	p50	p75	Max
Biodiversity Policy	0.074	0.262	0.000	0.000	0.000	0.000	1.000
Managerial Myopia	0.114	0.092	0.000	0.0048	0.093	0.156	0.445
Size	9893.627	15,683.728	253.000	2402.000	5022.000	10,644.000	107,000.000
Transparency	0.089	0.075	0.001	0.031	0.070	0.127	0.390
Leverage	0.459	0.191	0.075	0.316	0.458	0.602	0.939
Liquidity	1.916	1.644	0.284	1.042	1.458	2.182	12.25
PPE	6.505	13.383	0.013	0.770	2.012	5.265	88.89
SOE	0.517	0.500	0.000	0.000	1.000	1.000	1.000
Operating Cycle	2.121	2.058	0.148	0.827	1.643	2.665	20.415
Cash Ratio	0.599	0.774	0.024	0.190	0.351	0.669	5.481

Note for Table 1: This table presents the descriptive statistics of the key variables employed in this study, including the mean, standard deviation (SD), minimum (Min), and maximum (Max) values. The variables include biodiversity policy scores, managerial myopia indicators, and various financial metrics. PPE (Property, Plant, Equipment) is reported in billions.

Table 2
Pairwise correlations.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Biodiversity Policy	1.000									
(2) Managerial Myopia	−0.018	1.000								
	(0.163)									
(3) Size	0.185*	0.050*	1.000							
	(0.000)	(0.000)								
(4) Transparency	0.007	−0.052*	0.023	1.000						
	(0.579)	(0.000)	(0.084)							
(5) Leverage	0.098*	0.096*	0.246*	−0.050*	1.000					
	(0.000)	(0.000)	(0.000)	(0.000)						
(6) Liquidity	−0.074*	−0.079*	−0.187*	0.101*	−0.672*	1.000				
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)					
(7) PPE	0.286*	0.095*	0.554*	0.011	0.271*	−0.246*	1.000			
	(0.000)	(0.000)	(0.000)	(0.404)	(0.000)	(0.000)				
(8) SOE	0.101*	0.180*	0.104*	−0.094*	0.202*	−0.153*	0.194*	1.000		
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)			
(9) Operating Cycle	−0.049*	−0.001	−0.141*	0.109*	−0.081*	0.227*	−0.194*	−0.079*	1.000	
	(0.000)	(0.953)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		
(10) Cash Ratio	−0.040*	−0.059*	−0.137*	0.051*	−0.575*	0.808*	−0.158*	−0.089*	0.062*	1.000
	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	

Note for Table 2: This table displays the pairwise correlation coefficients between the main variables, along with *p*-values in parentheses. Asterisks (*) denote statistical significance levels, with (***) indicating significance at the 1 % level. The correlation between managerial myopia and biodiversity policy is highlighted to explore the preliminary association between short-term managerial focus and biodiversity-related efforts.

5. Empirical results

5.1. Basic regressions

This study employs Model (1) to test Hypothesis 1, with the results presented in Table 3, column (1). The table indicates that the coefficient for managerial myopia on biodiversity performance is −0.0083, which is statistically significant at the 1 % level (t-value = −2.61). This implies that a one-unit decrease in $MM_{i,t}$ leads to an increase of 0.83 % in $Biodiv_{i,t}$. These findings suggest that managerial myopia tends to inhibit corporate biodiversity performance, providing preliminary support for Hypothesis 1. This result underscores the importance for corporate managers to be cognizant of how their temporal orientation influences corporate actions, advocating for rational decision-making that balances multiple interests. Furthermore, key stakeholders should exert their influence to mitigate the impact of managerial styles on the firm to prevent further adverse outcomes.

5.2. Robustness tests

We employed a variety of robustness tests which we describe in brief here with full details available online. The results are essentially unchanged. We employ the Two-Stage Least Squares (2SLS) and GMM method to address potential endogeneity issues. We use the methods of Dechow, Kothari, and Watts (1998) and Roychowdhury (2006) to measure the degree of real earnings management ($TREM_{i,t}$) (Dechow et al., 1998; Roychowdhury, 2006). Additionally, we employ the WW index, as suggested by Livdan, Sapriza, and Zhang (2009), to gauge the extent of firms' financial constraints ($WW_{i,t}$) (Livdan et al., 2009). These two variables serve as instrumental variables in the 2SLS regression. Real earnings management reflects managerial self-interest behavior, aiming to adjust actual transactions to manipulate reported earnings figures. We continue to employ the degree of real earnings management ($TREM_{i,t}$) and the WW index ($WW_{i,t}$) as proxies for the firm's financing constraints, serving as instrumental variables in the GMM dynamic panel estimation. GMM dynamic panel estimation addresses this issue by generating valid instruments from the lagged variables, thereby yielding unbiased and consistent estimates.

The Heckman two-stage model is suitable for sample selection bias. Management shareholding can mitigate corporate governance shortcomings, thereby curbing managerial myopia (Jensen & Murphy, 1990). We select managerial shareholdings ($MngShare_{I,t}$) as the exclusion restriction variable(Wang, 2024). We regress these explanatory variables against the dummy variable $MM-Dummy_{I,t}$ representing $MM_{I,t}$, incorporating the Inverse Mills Ratio (IMR) calculated as a control variable into the baseline regression model (Table 4, column (7)), and conduct regression testing anew. We verify this relationship using the three-stage least squares (3SLS) method to construct a simultaneous equation model, treating biodiversity and myopia as the dependent variables in two separate equations. Both equations consider time and

Table 3
Basic regression and the moderating effect of supervisors.

	$Biodiv_{i,t}$												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Basic regression	High analyst focus	Low analyst focus	High report focus	Low report focus	High supervisory institutional investors' focus	Low supervisory institutional investors' focus	High media concern	Low media concern	High government engagement	Low government engagement	High internal control	Low internal control
$MM_{i,t}$	−0.0083**	−0.0056	−0.0126**	−0.0053	−0.0125**	−0.0056	−0.0128**	−0.0027	−0.0131**	0.0146	−0.0103**	−0.0071	−0.0073*
	(−2.61)	(−1.35)	(−2.52)	(−1.23)	(−2.60)	(−1.31)	(−2.67)	(−0.53)	(−3.36)	(1.34)	(−3.05)	(−1.39)	(−1.87)
$Size_{i,t}$	0.0182**	0.0155**	0.0186	0.0143*	0.0238*	0.0198**	0.0204**	0.0137*	0.0335**	−0.0147	0.0216**	0.0195**	0.0130
	(2.91)	(2.11)	(1.53)	(1.95)	(1.79)	(2.30)	(2.00)	(1.81)	(2.64)	(−1.09)	(3.03)	(2.36)	(1.23)
$Transparency_{i,t}$	0.0010	0.0010	−0.0014	0.0016	−0.0025	0.0002	0.0023	0.0031	0.0015	−0.0170	0.0011	0.0058	−0.0047
	(0.30)	(0.23)	(−0.27)	(0.37)	(−0.48)	(0.04)	(0.45)	(0.64)	(0.30)	(−1.36)	(0.32)	(1.10)	(−1.07)
$Leverage_{i,t}$	−0.0031	0.0004	−0.0044	0.0013	−0.0063	0.0065	−0.0127**	−0.0092	−0.0048	0.0259*	−0.0060	−0.0038	−0.0058
	(−0.70)	(0.07)	(−0.68)	(0.22)	(−0.94)	(0.85)	(−2.29)	(−1.34)	(−0.80)	(1.71)	(−1.28)	(−0.49)	(−1.08)
$Liquidity_{i,t}$	−0.0041	−0.0032	−0.0124	−0.0042	−0.0092	0.0077	−0.0158*	0.0036	−0.0205**	−0.0184	−0.0053	0.0058	−0.0187**
	(−0.82)	(−0.51)	(−1.33)	(−0.68)	(−0.96)	(1.20)	(−1.85)	(0.48)	(−2.61)	(−1.42)	(−0.96)	(0.76)	(−2.72)
$PPE_{i,t}$	0.0682**	0.0767**	0.0497**	0.0759**	0.0525**	0.0678**	0.0628**	0.0797**	0.0325**	0.0973**	0.0544**	0.0717**	0.0691**
	(8.98)	(8.59)	(3.57)	(8.35)	(3.83)	(7.16)	(4.93)	(9.10)	(2.30)	(5.13)	(6.37)	(6.72)	(6.41)
$SOE_{i,t}$	0.0106**	0.0048	0.0182**	0.0041	0.0192**	0.0029	0.0202**	0.0084	0.0175**	−0.0143	0.0131**	0.0142**	0.0057
	(2.83)	(0.96)	(3.46)	(0.81)	(3.84)	(0.51)	(3.91)	(1.34)	(3.92)	(−1.08)	(3.27)	(2.36)	(1.25)
$Oper\text{Cycle}_{i,t}$	0.0035	0.0042	0.0044	0.0052	0.0039	0.0022	0.0068	0.0006	0.0064	0.0196	0.0041	0.0040	0.0028
	(0.88)	(0.80)	(0.76)	(0.98)	(0.68)	(0.42)	(1.06)	(0.11)	(1.09)	(1.09)	(1.00)	(0.69)	(0.55)
$Cash_{i,t}$	0.0014	−0.0024	0.0159	−0.0003	0.0096	−0.0132**	0.0137	−0.0136**	0.0241**	0.0209**	0.0014	−0.0179**	0.0223**
	(0.28)	(−0.39)	(1.62)	(−0.05)	(1.02)	(−2.20)	(1.59)	(−2.36)	(2.61)	(1.97)	(0.26)	(−2.59)	(2.93)
Intercept	0.0838*	0.0672	0.1108	0.0712	0.0979	0.0035	0.1703	0.0033	0.1571	0.0790	0.0772	0.0223	0.1303
	(1.71)	(1.27)	(1.06)	(1.35)	(0.94)	(0.24)	(1.43)	(0.22)	(1.33)	(0.99)	(1.57)	(1.22)	(1.57)
Observations	5836	3665	2171	3621	2215	3050	2786	3107	2729	693	5143	2786	3050
R^2	0.1721	0.2148	0.1428	0.2097	0.1569	0.2076	0.1774	0.2353	0.1218	0.4451	0.1488	0.2160	0.1752
Adjusted R^2	0.1605	0.1971	0.1121	0.1917	0.1273	0.1860	0.1546	0.2148	0.0970	0.3962	0.1353	0.1943	0.1527
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Chow-Test(p-value)		1.99*** (0.000)		2.07*** (0.000)		2.14*** (0.000)		2.50*** (0.000)		2.99*** (0.000)		2.73*** (0.000)	

Note for Table 3: This table summarizes the regression results examining the impact of managerial myopia on biodiversity performance. Figures in parentheses represent the corresponding t-values, while the asterisks (***, **, *) signify *p*-values below the thresholds of 0.01, 0.05, and 0.10, respectively. Columns (1) reports the baseline regression results, showing a significantly negative relationship between managerial myopia and biodiversity initiatives. Columns (2) through (13) investigate potential mechanisms, focusing on supervision factors such as analyst attention, institutional investor oversight, media exposure, government engagement, and internal control quality. The findings suggest that the inhibitory effect of managerial myopia on biodiversity is mitigated in contexts with stronger supervisory mechanisms but remains significant in settings with weaker oversight.

Table 4
Heterogeneity analysis of stress.

	Biodiv$_{i,t}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	High environmental regulations	Low environmental regulations	High resource reliability	Low resource reliability	High competition	Low competition	High innovation	Low innovation
MM$_{i,t}$	−0.0032	−0.0136**	0.0003	−0.0072**	−0.0082*	−0.0072	−0.0081**	−0.0071
	(−0.79)	(−2.72)	(0.02)	(−2.26)	(−1.91)	(−1.47)	(−2.16)	(−1.14)
Size$_{i,t}$	0.0151**	0.0237**	−0.0456**	0.0234**	0.0283**	0.0169*	0.0176**	0.0191*
	(2.04)	(2.23)	(−2.26)	(3.57)	(3.28)	(1.67)	(2.24)	(1.79)
Transparency$_{i,t}$	0.0066*	−0.0232**	−0.0974**	0.0037	0.0108**	−0.0064	0.0012	0.0003
	(1.66)	(−3.31)	(−3.34)	(1.12)	(2.01)	(−1.40)	(0.32)	(0.05)
Leverage$_{i,t}$	−0.0026	0.0011	0.0021	−0.0023	0.0040	−0.0064	−0.0021	−0.0085
	(−0.44)	(0.17)	(0.09)	(−0.54)	(0.71)	(−0.80)	(−0.40)	(−0.97)
Liquidity$_{i,t}$	−0.0017	−0.0214**	0.0575	−0.0056	0.0143	−0.0069	−0.0029	−0.0120
	(−0.27)	(−2.22)	(1.54)	(−1.12)	(1.35)	(−1.13)	(−0.50)	(−1.11)
PPE$_{i,t}$	0.0695**	0.0519**	0.1747**	0.0612**	0.0564**	0.0685**	0.0680**	0.0728**
	(7.95)	(3.59)	(5.07)	(7.85)	(4.84)	(6.39)	(7.30)	(5.46)
SOE$_{i,t}$	0.0150**	−0.0033	0.0022	0.0109**	0.0085*	0.0175**	0.0147**	0.0004
	(3.15)	(−0.50)	(0.07)	(2.92)	(1.65)	(3.02)	(3.42)	(0.05)
*Oper*Cycle$_{i,t}$	0.0061	−0.0063	−0.1554**	0.0061	0.0003	0.0020	0.0039	0.0023
	(1.23)	(−0.94)	(−3.89)	(1.53)	(0.03)	(0.40)	(0.86)	(0.27)
Cash$_{i,t}$	−0.0027	0.0198**	−0.0253	0.0018	−0.0112	0.0029	0.0005	0.0056
	(−0.45)	(2.07)	(−0.78)	(0.36)	(−1.16)	(0.47)	(0.08)	(0.56)
Intercept	0.0926	0.0300*	0.3670**	0.0833*	0.0336*	0.1014	0.0777	0.2282
	(1.49)	(1.67)	(2.62)	(1.69)	(1.91)	(1.26)	(1.58)	(1.17)
Observations	4328	1508	322	5514	2784	3052	4234	1602
R^2	0.1708	0.3209	0.3178	0.1647	0.2162	0.1965	0.1797	0.1944
Adjusted R^2	0.1550	0.2878	0.2652	0.1535	0.1945	0.1746	0.1636	0.1641
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Chow-Test(p-value)	3.21*** (0.000)		6.77*** (0.000)		3.05*** (0.000)		1.39** (0.026)	

Note for Table 4: This table explores the heterogeneous effects of external pressures, including environmental regulation, resource dependence, industry competition, and innovation intensity, on the relationship between managerial myopia and biodiversity performance. Figures in parentheses indicate the respective t-values, while the asterisks (***, **, *) denote p-values below 0.01, 0.05, and 0.10, respectively. The results reveal that the negative impact of managerial myopia on biodiversity performance is pronounced under conditions of lower environmental regulation, lower resource dependence, higher industry competition, and greater innovation intensity, but is not significant in contrasting scenarios. These findings underscore the moderating role of external pressures.

industry fixed effects. By jointly estimating these equations, the final results consider the mutual influences of both factors and still support our main conclusions.

5.3. Mechanism tests

We primarily focus on the influence of managerial myopia on biodiversity. This effect stems from several factors including agency issues, risk preferences, and operational errors. Effective internal and external monitoring mechanisms can enhance corporate transparency and compensate for deficiencies in corporate governance systems, thereby mitigating the impact of managerial myopia on biodiversity performance. This section aims to examine the mechanisms of both internal and external corporate oversight. Specifically, this paper explores the effects of external oversight from three perspectives: analyst attention, monitoring by institutional investors, and media coverage; and the role of internal oversight is examined through the quality of internal controls.

This study selects the number of analysts following the firm *Analysts*$_{i,t}$ and the number of research reports *Repoets*$_{i,t}$ as indicators of analyst attention. Based on annual and industry medians, samples are divided into high and low attention groups and are regressed using Model (1). As shown in Table 3, columns (2) and (4) represent high analyst attention groups measured by the number of people and reports, respectively, while columns (3) and (5) represent low attention groups. Comparing the coefficients and significance of the explanatory variable MM$_{i,t}$ on the dependent variable *Biodiv*$_{i,t}$, firms receiving higher analyst attention exhibit a weaker suppressive effect of managerial myopia on biodiversity performance. As indicated in Table 3, the suppressive effect of MM$_{i,t}$ on *Biodiv*$_{i,t}$ is significant in the low attention group but disappears in the high attention group, with significant inter-group differences. This confirms that analyst attention serves as an effective external oversight mechanism, influencing managers to control the impact of short-sightedness on biodiversity performance, supporting findings from previous research (Hu et al., 2021), thereby validating Hypothesis H2a.

The study groups samples based on the attention of monitoring institutional investors *Institution*$_{i,t}$, measuring the oversight impact of such investors, which include government, funds, financial institutions, corporate investors, and Qualified Foreign Institutional Investors (QFII). Given that some institutional investors may not fulfill their oversight duties due to inherent characteristics or conflicts of interest, this study selects securities investment funds, social security funds, and QFIIs as monitoring investors, using their annual total shareholdings as a percentage of total shares as a measure of attention. Regression results, as shown in columns (6) and (7) of Table 3, reveal that firms with greater attention from monitoring institutional investors exhibit a weaker suppressive effect of managerial myopia on biodiversity performance. The suppressive effect of MM$_{i,t}$ on *Biodiv*$_{i,t}$ is significant in the low attention group but disappears in the high attention group, with significant inter-group differences. This indicates that the involvement of monitoring institutional investors can significantly enhance corporate transparency, reducing the likelihood of opportunistic behavior by management under pressure, further validating Jensen's views (Jensen & Meckling, 1976; Jensen & Murphy, 1990), and thus confirming Hypothesis H2b.

Media attention *Media*$_{i,t}$ is used as a standard for grouping samples to assess the impact of public opinion oversight. The media monitoring indicator is measured by the total number of annual online news and magazine articles mentioning the company. Results in columns (8) and (9) of Table 3 show that firms with higher media exposure exhibit a

weaker suppressive effect of managerial myopia on biodiversity performance. The suppressive effect of $MM_{i,t}$ on $Biodiv_{i,t}$ is significant in the low media attention group but disappears in the high media attention group, with significant inter-group differences. This suggests that external media oversight can fully disclose the corporate operational processes, imposing legitimacy-based pressure on the company. Even if the management has short-sighted motives, it becomes difficult to implement them, thereby validating Hypothesis H2c.

The Government-Guided Fund $GGF_{i,t}$ serves as a basis for sample grouping to assess the role of government oversight mechanisms. This fund represents a unique investment initiated by the government and managed by venture capital institutions. Firms receiving such investments typically gain privileged access to government resources, enhanced credit support, and stricter governance oversight. For a given year, $GGF_{i,t}$ is assigned a value of 1 if the firm benefits from Government-Guided Fund investment and 0 otherwise. The results reported in columns (10) and (11) of Table 3 reveal that the suppressive effect of $MM_{i,t}$ on $Biodiv_{i,t}$ diminishes in firms supported by the Government-Guided Fund. In firms without such investment, $MM_{i,t}$ exerts a significant negative impact on $Biodiv_{i,t}$. However, this effect is absent in firms benefiting from Government-Guided Fund involvement, with statistically significant differences observed between the two groups. These findings suggest that the Government-Guided Fund reduces performance pressures by reinforcing firms' connections with the government and simultaneously cultivating a stronger commitment to ecological development, which supports Hypothesis H2d.

Finally, following the measurement approach by Chan, Kam, Chen, & Baohua (2021) (Chan, Chen, & Liu, 2021, the study groups samples based on internal control quality $DIB_{i,t}$, sourced from the DIB database, to assess the impact of opinion oversight. Results shown in columns (12) and (13) of Table 3 indicate that firms with higher internal control quality exhibit a weaker suppressive effect of managerial myopia on biodiversity performance. The suppressive effect of $MM_{i,t}$ on $Biodiv_{i,t}$ is significant in the low internal control quality group but disappears in the high internal control quality group, with significant inter-group differences. This suggests that external media oversight can fully disclose corporate production and operational processes, applying legitimacy-based pressure on the company. Even if management has short-sighted motives, it is challenging to act on them, echoing previous research based on legitimacy and stakeholder participation (Bendell & Huvaj, 2020; Mitchell et al., 1997), thereby confirming Hypothesis H2e.

6. Further study

6.1. Heterogeneity analysis of stress

Prior research indicates that external pressures faced by managers or corporations can influence managerial behavior, exacerbating principal-agent problems and thereby altering corporate strategies (Bluedorn & Martin, 2008). This paper aims to test the heterogeneity of four types of pressures, one associated with regional policy pressures and the others stemming from industry characteristics.

We employ the Environmental Regulation Index ($ERI_{i,t}$) to quantify the ecological and species protection policy pressures faced by firms within their respective provinces (Z. Chen & Xie, 2022). This study categorizes samples based on the median within the same industry and year, utilizing data from the China Statistical Yearbook, China Environmental Statistics Yearbook, and China City Statistical Yearbook. Regression results are presented in columns (1) and (2) of Table 5. By comparing the coefficients and significance of the explanatory variable $MM_{i,t}$ on the dependent variable $Biodiv_{i,t}$, we find that firms in regions with stricter environmental regulations exhibit a weaker suppressive effect of managerial myopia on biodiversity performance. The suppressive effect of $MM_{i,t}$ on $Biodiv_{i,t}$ is significant in groups with low

Table 5
Economic consequence.

	$TbQ_{i,t}$	$TbQ_{i,t}$	$EPS_{i,t}$	$EPS_{i,t}$	$ROA_{i,t}$	$ROA_{i,t}$
	(1)	(2)	(3)	(4)	(5)	(6)
$MM_{i,t}$	−0.0392**	−0.0370**	−0.0544**	−0.0527**	−0.0669**	−0.0659**
	(−4.44)	(−4.19)	(−4.66)	(−4.50)	(−5.27)	(−5.18)
$Biodiv_{i,t}$		0.2632**		0.2102**		0.1220**
		(4.03)		(3.49)		(2.93)
$Size_{i,t}$	0.4974**	0.4926**	0.1379**	0.1341**	0.0956**	0.0000**
	(15.50)	(15.38)	(6.49)	(6.26)	(7.44)	(7.28)
$Transparency_{i,t}$	0.1198**	0.1195**	0.0451**	0.0449**	0.0238*	0.0196*
	(9.21)	(9.25)	(2.99)	(2.98)	(1.70)	(1.69)
$Leverage_{i,t}$	−0.0877**	−0.0869**	−0.2183**	−0.2176**	−0.4788**	−0.1568**
	(−7.13)	(−7.13)	(−12.18)	(−12.18)	(−22.60)	(−22.61)
$Liquidity_{i,t}$	−0.0254	−0.0243	−0.0758**	−0.0749**	−0.0160	−0.0006
	(−1.14)	(−1.09)	(−3.30)	(−3.27)	(−0.59)	(−0.57)
$PPE_{i,t}$	0.2190**	0.2011**	0.0637**	0.0494**	0.0248*	0.0000
	(7.47)	(6.64)	(2.82)	(2.12)	(1.82)	(1.18)
$SOE_{i,t}$	−0.0350**	−0.0378**	−0.0143	−0.0165	−0.0793**	−0.0101**
	(−3.05)	(−3.35)	(−0.98)	(−1.12)	(−5.64)	(−5.73)
$OperCycle_{i,t}$	0.0739**	0.0729**	−0.0034	−0.0041	−0.0540**	−0.0017**
	(5.62)	(5.56)	(−0.21)	(−0.26)	(−3.52)	(−3.55)
$Cash_{i,t}$	0.0766**	0.0763**	0.0670**	0.0667**	0.0326	0.0026
	(4.01)	(4.00)	(2.92)	(2.91)	(1.31)	(1.30)
Intercept	−0.3494**	−0.3715**	−0.7933**	−0.8109**	−0.5336**	−0.5438**
	(−5.20)	(−5.52)	(−9.54)	(−9.63)	(−3.43)	(−3.49)
Observations	5834	5834	5836	5836	5836	5836
R^2	0.4378	0.4418	0.1931	0.1956	0.2990	0.2999
Adjusted R^2	0.4299	0.4338	0.1818	0.1842	0.2892	0.2899
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Sobel-Z (p-value)	−2.1812**(0.0292)		−2.0821**(0.0373)		−1.9429** (0.0520)	

Note for Table 5: This table examines the economic implications of biodiversity performance by evaluating its mediating role in the relationship between managerial myopia and corporate value. Figures in parentheses represent the corresponding t-values, while the asterisks (***, **, *) denote p-values below 0.01, 0.05, and 0.10, respectively. Corporate value metrics include Tobin's Q, earnings per share (EPS), and return on assets (ROA). Through a three-step mediation analysis, the table highlights the mechanisms by which biodiversity initiatives contribute to short-term profitability and long-term value creation.

environmental regulation but disappears in groups with high regulation, with significant inter-group differences. This suggests that stronger local environmental policies increase the policy pressure on corporate management, making it difficult for managers to evade responsibilities related to environmental protection and thus blocking the impact of managerial myopia on corporate biodiversity initiatives. Hence, local governments can effectively reduce opportunistic behaviors in environmental management by imposing moderate environmental regulatory pressures, significantly encouraging corporations to engage in environmentally friendly public initiatives.

The degree of industry reliance on natural resources directly translates into the severity of biodiversity risks. The urgency of addressing biodiversity issues likewise pressures managers. Following the study by Bassen et al. (2024) (Bassen et al., 2024), a dummy variable ($RR_{i,t}$) is set to measure the degree of resource reliability. When companies belong to agriculture, forestry, animal husbandry, fisheries, or mining, $RR_{i,t}$ is set to 1, otherwise 0. Results are shown in columns (3) and (4) of Table 5. The suppressive effect of $MM_{i,t}$ on $Biodiv_{i,t}$ is significant in the low resource dependence group but disappears in the high dependence group. Comparison of the coefficients and significance suggests that firms in industries with higher resource dependence have a weaker suppressive effect of managerial myopia on biodiversity performance. This aligns with the research by Bassen et al., indicating that when biodiversity risks lead to severe consequences, managers are less likely to focus decision-making on corporate performance, thereby hindering biodiversity initiatives.

This paper employs the Enterprise Lerner Index ($ELI_{i,t}$) to quantify the industry competition pressures faced by firms (Elzinga & Mills, 2011). Samples are differentiated into high and low industry competition groups based on the median within the same industry and year. Results in columns (5) and (6) of Table 5 show that firms in industries with stronger competition exhibit a stronger suppressive effect of managerial myopia on biodiversity performance. The effect of $MM_{i,t}$ on $Biodiv_{i,t}$ is significant in the high competition group but disappears in the low competition group, with significant inter-group differences. This indicates that competitive pressures within an industry translate to managerial pressures, prompting short-sighted managers to focus more on core business and profitability while neglecting ESG issues such as environmental protection, consistent with prior scholarly views (Ding et al., 2024; Souder & Bromiley, 2012).

The 2020s, a greener and technologically advanced era, have shown that industry innovation impacts managerial temporal orientation cognition, affecting long-term decision-making (Lin et al., 2019). This study uses the number of green patents within an industry ($GP_{i,t}$) to measure the level of industry innovation and groups samples based on the median. Results in columns (7) and (8) of Table 4 reveal that firms in more innovative industries exhibit a stronger suppressive effect of managerial myopia on biodiversity performance, with significant inter-group differences. This indicates that the level of industry innovation creates an intangible competitive pressure, causing managers to focus more on tangible outcomes such as green patent counts while neglecting morally obliged improvements in biodiversity performance.

6.2. Economic consequence

To fully appreciate the economic consequences central to this study, we proceed to analyze whether the relationship between managerial myopia and biodiversity performance impacts corporate value.

Corporate value remains a perennial theme in financial research. The Ohlson model views it as the sum of past equity and the discounted value of future earnings (Ohlson, 1995). From a valuation perspective, earnings represent the value created by a company in a business cycle, while stock prices reflect the total value accumulated over the company's operational history. Historically, corporate social welfare was synonymous with “creating economic value” primarily for shareholders. Nowadays, with increasing emphasis on sustainable development and biodiversity conservation, the value created by corporations encompasses contributions to environmental protection, extending to a broader array of stakeholders (Steurer, Langer, Konrad, & Martinuzzi, 2005). Studies have shown that corporate biodiversity can enhance corporate value through various means such as risk reduction and increased legitimacy (Van HOANG1a, NGUYEN, TEDESCHI, PHAM, & BUIRETTE; White et al., 2023).

This paper uses the Tobin's Q ratio ($TbQ_{i,t}$) as a measure of long-term value creation capacity, and Earnings Per Share ($EPS_{i,t}$) and Return on Assets ($ROA_{i,t}$) as measures of short-term value creation capacity. A three-step method is employed to explore this potential impact pathway, with the models also considering clustered robust standard errors.

$$TbQ_{i,t}/EPS_{i,t}/ROA_{i,t} = \alpha_0 + \alpha_1 MM_{i,t} + \lambda Controls + \delta_{ind} + \theta_t + \varepsilon_{i,t} \quad (2\text{-}1)$$

$$Biodiv_{i,t} = \beta_0 + \beta_1 MM_{i,t} + \lambda Controls + \delta_{ind} + \theta_t + \varepsilon_{i,t} \quad (2\text{-}2)$$

$$TbQ_{i,t}/EPS_{i,t}/ROA_{i,t} = \gamma_0 + \gamma_1 Biodiv_{i,t} + \gamma_2 MM_{i,t} + \lambda Controls + \delta_{ind} + \theta_t + \varepsilon_{i,t} \# \quad (2\text{-}3)$$

In Model (2-1), upon significant estimation of α_1, Models (2-2) and (2-3) are estimated; if β_1 is significantly negative and γ_1 is significantly positive, it indicates a significant mediating effect, where managerial myopia reduces corporate value by diminishing biodiversity performance. If γ_2 is also significant, it suggests that biodiversity performance plays a partial mediating role. If either β_1 or γ_1 is insignificant, the Sobel test is used to determine the significance of the mediating effect $\beta_1 \times \gamma_1$.

If α_1 in Model (2–1) is statistically significant (95 % confidence interval does not include zero), it suggests that $MM_{i,t}$ significantly explains variations in $TbQ_{i,t}/EPS_{i,t}/ROA_{i,t}$, known as the Total Effect. If β_1 in Model (2–2) is significant, it indicates that $MM_{i,t}$ significantly explains changes in $Biodiv_{i,t}$. If γ_1 and γ_2 in Model (3) are significant, it shows that considering both $MM_{i,t}$ and $Biodiv_{i,t}$ together, they significantly explain variations in $TbQ_{i,t}/EPS_{i,t}/ROA_{i,t}$, with γ_2 as the Direct Effect. If both β_1 and γ_1 are significant, the mediation mechanism exists. If γ_2 is also significant and $\beta_1 \times \gamma_1$ (i.e., Sobel-Z) and γ_2 are of the same sign, it indicates partial mediation, suggesting that $MM_{i,t}$ promotes $TbQ_{i,t}/EPS_{i,t}/ROA_{i,t}$ not only by promoting $Biodiv_{i,t}$.

Columns (1) and (2) of Table 5 test the mediating role of biodiversity on $TbQ_{I,t}$; columns (3) and (4) test its role on $EPS_{I,t}$; and columns (5) and (6) on $ROA_{I,t}$. The coefficients for $MM_{i,t}$ are significantly negative across these measures, indicating that managerial myopia significantly reduces corporate value. Furthermore, columns (2), (4), and (6) show that the coefficients for $MM_{i,t}$ are significantly negative at the 5 % level, while those for $Biodiv_{i,t}$ are significantly positive. The Sobel test statistic is also significantly negative at the 5 % level.

Our results demonstrate that managerial myopia, by hindering efforts to enhance biodiversity performance, reduces corporate profitability in the short term and overall value in the long term. Managerial myopia prevents addressing the urgent risks associated with biodiversity. If investors require additional risk compensation for biodiversity risks, it could impact corporate value (Garel et al., 2023). The initial intent of managerial myopia might be to maximize personal benefits and minimize costs (Jensen & Meckling, 1976), yet this inadvertently leads to more significant issues, such as increasing future stock price crash risks (Bassen et al., 2024) and weakening short-term profitability and long-term value. Moreover, the impediment posed by managerial myopia to corporate engagement in environmental initiatives not only changes investor perceptions but also decreases satisfaction among other stakeholders. Corporate myopic behavior, by shirking social obligations and deviating from societal progress, weakens legitimacy (Freeman et al., 2021). Furthermore, stakeholders and nature, as providers of critical strategic resources, mean that reduced legitimacy can create barriers in resource acquisition (Carvalho et al., 2023), such as suppliers and customers ending partnerships or long-term value

investors, communities, and environmentalists ceasing to actively affirm the company. Thus, both the short- and long-term values of the company are affected. KPMG's, 2022 sustainability report cites Yili Group as an example. Yili Group has established a full lifecycle biodiversity protection management system and promotes green production throughout its supply chain, thereby providing broader space for the company's sustainable development (KPMG, 2022). This case is a typical example of how a long-term managerial orientation fosters biodiversity performance, thereby enhancing the company's long-term value.

7. Discussion

Previous research has already proven that myopic cognition in management can lead to undesirable behaviors on a financial level, which then result in poor outcomes such as distorting investment decisions and manipulating financial reports (Arrfelt et al., 2013; Brochet et al., 2015; Hu et al., 2021). Our conclusions do not contradict previous research. According to the findings of this paper, biodiversity performance is also an important behavioral consequence of managerial myopia. Inappropriately addressing biodiversity risks can be considered an inefficient investment, diverging from the optimal utility function for all stakeholders. Additionally, the biodiversity data used in this paper is sourced from corporate public disclosures via Bloomberg. As Chinese firms, investors, and other stakeholders currently do not prioritize biodiversity issues, this paper assumes that all sampled firms do not have manipulated reports regarding this matter. All biodiversity policy disclosure data are assumed to represent the true state of biodiversity performance. However, studies have shown that firms tend to engage in symbolic biodiversity disclosures (Haque & Jones, 2020). If myopic or opportunistic managers manage earnings to enhance performance or appease investors, they could manipulate these disclosures for similar reasons when biodiversity becomes significant.

To enhance corporate engagement in biodiversity, it is imperative that efforts begin by curbing the influence of managerial short-sightedness on significant corporate decisions. Firstly, strengthening internal oversight mechanisms is essential for effective daily operations. Robust corporate governance and internal control systems are indispensable for facilitating communication between the firm and its stakeholders and for making joint significant decisions. Increasing the diversity and independence of the board can introduce broader perspectives and diminish the focus on short-term gains. Directors with expertise in sustainability and environmental issues can advocate for long-term strategies that enhance biodiversity. Secondly, effective stakeholder engagement is essential in exerting pressure on management. According to our research, companies should strengthen their stakeholder governance systems, expanding channels for stakeholder expression and communication. This includes creating open platforms to gather valuable insights from various societal sectors, enhancing information transparency, establishing stakeholder advisory panels, and convening stakeholder representative meetings. Additionally, improving corporate information disclosure mechanisms is vital for bridging communication gaps between firms and society. There is a need to improve these mechanisms to guide companies in the correct value creation. Encouraging or mandating the integration of sustainability metrics into regular financial reporting can make the long-term environmental impact more transparent to investors and other stakeholders. This approach can reduce the emphasis on short-term financial results and increase the focus on long-term sustainability. Furthermore, fostering a corporate culture that prioritizes long-term success over short-term gains is instrumental in mitigating managerial myopia. This requires consistent communication from the top levels of leadership about the importance of sustainability and biodiversity as core business priorities. Indeed, when senior management embraces this mindset, the prevalence and adverse effects of short-sightedness are significantly diminished.

From the government's perspective, appropriate environmental policy pressures can directly prompt corporate action in this area and suppress other adverse tendencies that impede corporate environmental protection efforts, such as fines imposed by the government. Stakeholder pressure can be transformed into corporate motivation and execution. In addition, creating a favorable business environment, improving capital markets and corporate management mechanisms, and guiding industry self-discipline are indispensable. A well-functioning market mechanism and a moderately competitive environment enable companies to develop normally and maintain a healthy compensation structure. In this way, the pressures and rewards faced by management remain within a normal range, reducing the likelihood of short-sighted behavior. According to prior research and the conclusions of this paper, such an approach will yield benefits such as reduced earnings management, increased long-term investment, and improved environmental performance. Lastly, the government can invite companies to engage in policy advocacy efforts aimed at developing global standards for biodiversity and sustainability reporting. By promoting consistent and robust regulations across markets, companies can help create a level playing field where long-term environmental goals are prioritized.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.irfa.2025.103974.

Data availability

Data will be made available on request.

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