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The Impact of Managerial Myopia on Corporate Green Innovation

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Abstract: Whether managerial myopia shapes corporate green innovation has attracted surprisingly little attention. This paper examines that question directly. Evidence comes from 33,813 firm-year observations on 4,661 A-share firms listed in Shanghai and Shenzhen between 2010 and 2021, and the analysis covers three issues: the effect of managerial myopia on green innovation, the mediating channels of strategic alliances and R&D investment, and the moderating role of digital transformation. Managerial myopia turns out to hold green innovation back. A large part of the damage is indirect: myopic managers are less inclined to build alliances with other firms and they cut R&D spending, and both shifts dampen green innovation. Digital transformation pulls in the other direction, weakening the negative myopia-green innovation link and easing the myopia-alliance and myopia-R&D relationships as well. By placing managers' psychological traits at the center of the analysis, this paper enriches work on the antecedents of green innovation and offers firms practical guidance for green transformation and sustainable development.

Keywords: Green Innovation; Managerial Myopia; Strategic Alliances; R&D Investment; Digital Transformation

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1. Introduction

Environmental governance now commands attention worldwide. Every country faces the same difficult question: how to keep economies growing without putting environmental sustainability at risk. China has pushed green development hard, and its record in ecological protection has drawn notice, adding what observers often call a distinctly "Chinese green" element to global efforts on environmental governance and sustainable development. As the 20th National Congress of the Communist Party of China stressed, "promoting the green and low-carbon transformation of economic and social development is a key link in achieving high-quality development." Green innovation sits at the center of this agenda. It supplies the technological foundation for low-carbon production, and it has become one of the main ways firms build competitive advantages that last. Not surprisingly, scholars and practitioners alike have come to treat it as a subject worth close attention.

Managers stand at the heart of strategic decision-making, so their choices matter for whether a firm develops sustainably[1]. Upper echelons theory makes the point more precisely: the characteristics of top managers shape how they behave and what strategies they pick, which in turn shapes the goals a firm sets, the plans it makes, and the results it obtains. Innovation spending and green development are no exception, and both bear heavily on a firm's survival, growth, and long-run competitiveness. Cognition and willpower, however, are bounded. In practice managers often favor near-term gains over

longer-run development. Myopia of this kind can push a firm away from green innovation investment and environmental strategy, and that in turn slows its green transformation and its progress toward sustainability.

The paper's theoretical contributions fall into three areas. The first concerns green innovation itself. Because green innovation matters for both corporate sustainability and environmental protection, its drivers have been studied at length, internal ones and external ones alike. What remains thin is systematic evidence on the mechanism that links managerial myopia to green innovation. Managers with a short-term orientation chase quick returns and immediate interests, and firms run by such managers tend to under-invest in green innovation and to implement environmental strategy half-heartedly. Starting from upper echelons theory, this paper sets out a pathway running from managerial myopia to green innovation, and in doing so it highlights how much managers' psychological characteristics shape green innovation behavior.

A second contribution lies in the mechanisms examined, namely alliance building and the allocation of R&D resources. Firms use strategic alliances to reach external resources, technologies, and knowledge, and alliances therefore matter for green innovation. Myopic managers, though, pay less attention to cooperation with outside partners, which limits how well external resources get integrated and used. Partnerships can drift, the flow of outside knowledge and technology slows, and the firm's capacity to compete on green innovation suffers. Alliances rest on long-term cooperation and mutual trust, so the problem is especially acute there.

The third contribution concerns digital transformation. Information technology and digital tools have spread quickly, and firms increasingly treat digital transformation as a way to defend their competitive position. Research on its direct effects is plentiful; its moderating role between managerial myopia and green innovation is not. This paper argues that digital transformation signals technological progress and, at the same time, acts as a factor that conditions managerial behavior. Digital tools do deliver precise decision support, yet a manager focused on short-term interests must still reconcile their use with long-term green innovation goals. Digital transformation is no substitute for strategic vision. Even so, by improving resource allocation and lowering the uncertainty attached to innovation, it can ease the harm that myopia does to green innovation.

2. Literature Review

2.1 Green Innovation

Green innovation is the process by which a firm cuts its negative environmental footprint and raises resource efficiency through changes in technology, management, organization, or institutions, while at the same time securing both economic value and environmental benefits[2]. Innovations of this kind look beyond the environmental profile of a product: they also bear on whether production processes can be sustained and on how far environmental damage can be limited[3]. Underlying the concept are two goals that must be pursued together, environmental protection and economic growth. The idea is to fuse environmental thinking with technological change so that firms and society both move forward on environmental protection.

Work on the determinants of green innovation tends to split them into external and internal groups. Environmental regulation, the digital economy, green finance, and market pressure belong to the first group. On regulation, Zhang et al. report a nonlinear pattern, and specifically a significant inverted U-shaped relation with green innovation; they also find that market-based voluntary instruments stimulate green innovation more strongly than command-and-control rules[4]. On the digital economy, Sun et al. argue that merging the digital and real economies gives corporate green innovation a significant boost[5]. Green finance[6] and market pressure[7] likewise emerge as important external drivers.

Executive characteristics, digital capabilities, and ESG performance make up the internal side of the literature. Several studies report that overseas experience[8], gender differences[9], and executive pay[10] each raise corporate green innovation to some degree. Xia et al. show the reverse case: executives with no environmental experience hold green innovation back, and the more power such executives wield within the top team, the stronger their dampening effect on overall green innovation performance[11]. ESG performance[12] and digital capabilities[13] are also counted among the internal drivers that matter.

2.2 Managerial Myopia

Managerial myopia is a stable psychological trait: because of built-in cognitive biases, managers overrate short-term gains and underrate long-term value, and in strategic decisions they therefore show a clear preference for immediate outcomes

and neglect future interests[14]. Seen from a management angle, it is a decision-making bias that grows out of individual cognitive limits and shows up as an excessive concern with short-term performance in strategic choices, at the cost of long-term development potential; in essence it differs from opportunistic behavior that stems from agency problems. Seen from a psychological angle, it reflects how an individual relates to time, a stable and largely subconscious tendency to weight the present more heavily than the future.

Studies of what managerial myopia produces have concentrated on corporate performance, competitive advantage, and behavioral decision-making. Ridge et al. find that myopia damages corporate performance, while Brochet et al. and Hu et al. report a negative association between myopia and return on equity[15, 16]. Yu et al. show that myopic behavior frequently pulls a firm's investment in innovation activities downward[17]. Gao et al. find that dividend taxes levied on individual investors intensify managerial myopia[18], and Xu et al. examine how managerial myopia affects corporate green innovation in a sample of A-share listed firms[19]. Even so, the specific mechanisms at work and the boundary conditions under which they operate are still only partly understood.

2.3 Digital Transformation

Two strands of work define what digital transformation means. The first is technological. Scholars in this strand treat digital transformation as the adoption and integration of a set of advanced digital technologies, with technology itself as the engine. Bharadwaj et al. describe it as the process in which firms draw on digital resources such as big data, artificial intelligence, and cloud computing to build fresh digital capabilities and to develop digital products and services[20]. The second strand looks at organizational change, and there the question shifts away from the tools and toward how technology sets off deep shifts in a firm's structure, processes, and culture[21].

Research on what digital transformation delivers has focused on corporate performance, innovation capability, organizational structure, and environmental performance. Wang et al. report that it lifts corporate performance by cutting costs, raising R&D intensity, and strengthening human resources, with a sizeable positive effect across the manufacturing sector[22]. Xu et al. show a significant improvement in corporate innovation performance, and they identify big data capabilities and organizational agility as the two mediating links that carry the effect[23]. On the environmental side, Wang et al. find that digital transformation improves corporate environmental performance[24], and Zhang and Meng find that it raises the efficiency of regional green innovation[25].

2.4 Strategic Alliances

Strategic alliances appeared early in industry and take many forms. They are known variously as strategic cooperation, corporate alliances, or virtual enterprises, and they are defined as cooperative organizations that alliance partners establish by agreement in order to complement one another's strengths, share risks, and move production factors in two or more directions[26]. Their influence reaches beyond internal operations and resource allocation into corporate performance, innovation capability, and risk management. Cabral et al. show that diversified firms turn to alliances to obtain the external resources their innovation activities need[27]. Jiang et al. study how the diversity of an alliance portfolio relates to firm performance[28], and Ferreira et al. find that alliances advance innovation and new product development through knowledge sharing[29].

2.5 R&D Investment

As the innovation-driven development strategy has been rolled out, R&D spending and R&D intensity have become yardsticks for China's technological innovation capacity and have gained weight in macroeconomic decision-making and management. For a firm, R&D investment is both a central link in technological innovation and a means of staying competitive in the future. Wan et al. report a significant positive correlation between R&D investment and corporate performance, while noting that the effects take time to appear and are hard to sustain[30]. Li and Xiao apply threshold regression and find nonlinear effects of both R&D capital and R&D personnel on regional innovation performance[31]. Xu et al. find that R&D investment works alongside ESG performance to improve green innovation performance[32].

3. Theoretical Hypotheses

3.1 Managerial Myopia and Green Innovation

Managerial myopia describes a tendency among corporate decision-makers to pursue short-term performance and capital market recognition so single-mindedly that they systematically discount long-term value creation in strategy formulation and resource allocation. Green innovation sits awkwardly with that tendency. It runs on long cycles, demands heavy investment, and carries a great deal of uncertainty. Facing pressure to show quick results, management tends to squeeze the strategic investments whose payoffs are hard to demonstrate during its own tenure, and green innovation is exactly such an investment. Two theoretical paths are developed below to explain how managerial myopia bears on green innovation:

The first path draws on the resource-based view and starts from the pressure to keep short-term financial indicators in line, which distorts how resources are allocated internally. Green innovation needs continuous R&D expenditure and dedicated assets, and on the books these show up as lower current profits. To satisfy market expectations for stable or rising short-term earnings, management moves limited resources away from long-horizon projects such as green R&D and into activities that lift reported profits quickly. Green innovation then stalls for want of resources. The second path draws on agency theory and focuses on managers' appetite for risk. Green innovation carries uncertainty on two fronts, technological and market, and its outcomes are hard to forecast. A myopic manager worries that a failed innovation will damage reputation and pay, and so tends to steer clear of high-risk green projects in favor of short-term investments whose returns are more certain. The hypothesis that follows is:

H1: Managerial myopia significantly reduces corporate green innovation.

3.2 Mediating Effects of Strategic Alliances and R&D Investment

Managerial myopia usually shows up as an excessive concern with short-term growth in financial performance and rapid gains in the stock price, coupled with neglect of long-term development and strategic planning. Behavior of this sort dampens corporate R&D investment and colors innovation decisions. Strategic alliances offer firms a key route to complementary knowledge, technology, and resources from outside, and they play a role in green innovation that is hard to replace[33]. Through alliance networks firms reach across organizational boundaries, bring together industry, academic, and research capabilities, and tackle the heavy investment and high risk that green technology R&D involves, which strengthens their green innovation capability.

The first route runs through knowledge. Strategic alliances pool heterogeneous knowledge, giving management a channel to acquire the key green technologies and expertise it lacks. Close communication and technology sharing among partners widen managers' cognitive horizons and deepen their grasp of why green innovation matters strategically, which raises both their appreciation of long-term environmental investment and their commitment to it. A second route runs through goals. Alliances commit partners to shared long-term objectives and a common development vision, and this pushes management past a purely short-term financial mindset. Working inside an alliance framework, managers must plan sustainable technology paths and innovation blueprints together with their partners, and that exercise cultivates long-term strategic thinking and weakens the pull of myopia. Yet myopia can also lower a firm's willingness to invest in alliances and to keep them going, since alliance benefits often take a long time to appear. The hypothesis that follows is:

H2: Managerial myopia significantly reduces the formation of strategic alliances, and strategic alliances mediate the link between managerial myopia and corporate green innovation.

R&D investment is what allows a firm to carry out green innovation at all, and it plays a decisive part in advancing green technology. Sustained spending supplies the funding that green technology development requires, and it is also how a firm accumulates environmental knowledge, trains innovative talent, and builds technological capability. Myopic tendencies, however, can erode both the willingness to fund R&D and the intensity of that funding. Two paths carry the inhibitory effect:

The first path concerns resource allocation. Myopia produces structural cuts in internal R&D budgets. When short-term performance is the yardstick, managers direct scarce financial resources toward activities that pay off quickly, and R&D, especially green technology R&D with its long payback period and high failure risk, is often the first item trimmed. The second path concerns agency costs. Myopia heightens managers' reluctance to bear R&D risk. Given the specificity of R&D spending and its sunk-cost character, together with the dual uncertainty that surrounds green technology innovation, a myopic manager would rather cut R&D investment than risk a loss. The hypothesis that follows is:

H3: Managerial myopia significantly reduces corporate R&D investment, and R&D investment mediates the link between managerial myopia and corporate green innovation.

3.3 Moderating Effect of Digital Transformation

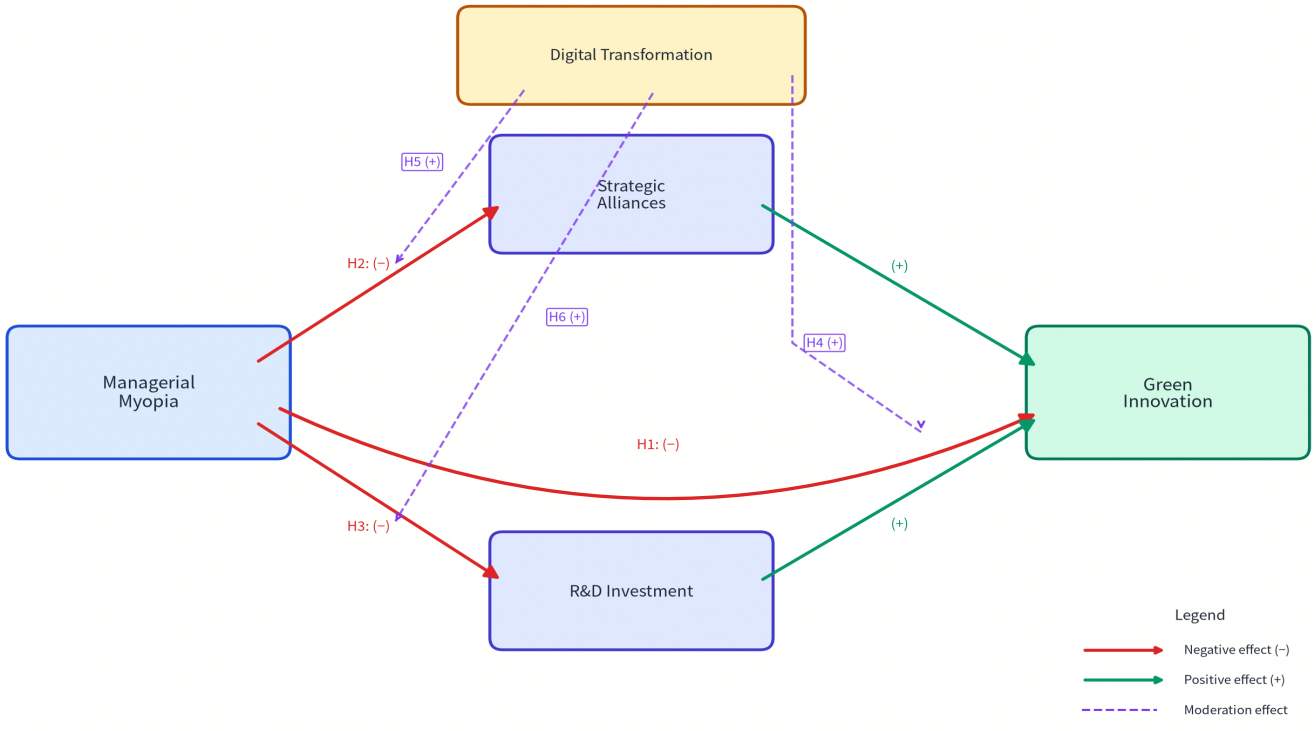
Digital transformation is a deep-seated process of change: firms apply a new generation of digital technologies, among them big data, artificial intelligence, cloud computing, and the Internet of Things, to fuse with and reshape their business processes, organizational structures, and business models. As a high-level dynamic capability, it now reaches well past the mere adoption of technology and has altered the logic by which firms make strategic decisions and the patterns of behavior they display.

Read through the lens of the resource-based view and agency theory, managerial myopia harms corporate green innovation in two ways: it distorts the structure of resource allocation, and it sharpens managers' reluctance to take risk. Digital transformation can counteract both. Consider resource allocation first. Because it rests on data-driven and intelligent decision-making, digital transformation raises internal information transparency and operational efficiency[34]. It therefore helps a firm meet short-term performance targets while still setting resources aside for green innovation, and it sharpens the precision of allocation, which reduces the inclination of myopic managers to cut long-term innovation spending. Now consider risk. Data analysis and simulation reduce the uncertainty attached to green innovation, so managers become less eager to avoid it. The hypothesis that follows is:

H4: Digital transformation positively moderates the myopia-green innovation relationship.

Digital transformation makes heterogeneous knowledge flow more efficiently and makes alliance governance more transparent, and through these channels it moderates the myopia-alliance relationship. Start with knowledge. Digital technologies sharply improve a firm's ability to spot, absorb, and digest heterogeneous knowledge from outside[35]. Alliance-based acquisition of knowledge therefore becomes more efficient and easier to observe, and a myopic manager can see more clearly what technological benefits an alliance will bring, which raises that manager's willingness to commit to long-term knowledge investment. Governance matters as well. Technologies such as blockchain and the Internet of Things create a more transparent and more trustworthy information environment within an alliance. Information asymmetry and opportunistic behavior among partners decline, the cost of governing the alliance falls, and myopic managers become readier to enter and to maintain alliances. The hypothesis that follows is:

Figure 1: Research Model



H5: Digital transformation positively moderates the myopia-strategic alliance relationship.

Digital transformation also moderates the myopia-R&D relationship, chiefly by making R&D resource allocation more efficient and by shrinking both R&D risk and agency costs. On the allocation side, technologies such as big data analytics and artificial intelligence let a firm pinpoint the core directions and market potential of green R&D, streamline R&D processes, and shorten the time it takes to convert technology into results. Long-term R&D goals get broken into quantifiable short-term milestones, so the short-term value of R&D spending becomes visible. That alleviates the myopic habit of favoring near-term returns over long-term R&D, and it reduces structural cuts to R&D budgets. On the risk side, digital simulation and real-time monitoring make R&D projects more predictable and more controllable, which lowers how risky such investment looks to a myopic manager. The hypothesis that follows is:

H6: Digital transformation positively moderates the myopia-R&D investment relationship.

Figure 1 lays out the research model used here.

4. Research Design

4.1 Sample and Data Sources

The sample consists of normally listed A-share firms on China's Shanghai and Shenzhen stock markets from 2010 to 2021. Green patent data, which green innovation requires, come from the China Research Data Services Platform (CNRDS). Text from the Management Discussion and Analysis (MD&A) sections comes from the CSMAR database, and the same database supplies financial and governance data for the sample firms across the period. Data processing proceeds in several steps. Following the list of Chinese listed companies released by the China Securities Regulatory Commission, ST and PT firms and firms in the financial industry are dropped first, so that the data remain complete and reliable. Samples with excessive missing values are removed next. All continuous variables are then winsorized at the 1% and 99% quantiles to limit the influence of outliers. The final sample contains 33,813 firm-year observations drawn from 4,661 listed enterprises.

4.2 Variable Measurement

4.2.1 Dependent Variable

Green Innovation (GI). Following existing research[36], green innovation is measured as the natural logarithm of the number of green invention patent applications plus green utility model patent applications, plus one. Green patents offer the most direct picture of what a firm's green technology innovation actually produces, and they carry quantifiable external spillovers that are relevant to the industry. The patent application process is also long, so relying on application data rather than grant data makes it possible to observe how managerial myopia affects green innovation activity sooner. As alternative measures for the robustness tests, the number of green invention patent applications and the number of green utility model patent applications are each used separately.

4.2.2 Independent Variable

Managerial Myopia (Myopia). The Management Discussion and Analysis (MD&A) section of an annual report usually reviews past performance and discusses the uncertainties and trends that lie ahead. Following existing research[37], short-term oriented words are counted in the MD&A text. The managerial myopia indicator divides the total frequency of those words by the total word count and multiplies the result by 100. A larger value means more pronounced managerial myopia.

4.2.3 Mediating Variables

Strategic Alliance (SA). Following existing research, strategic alliance announcements by listed companies form the basis of this measure, and not every announcement discloses how long the cooperation lasts. Where a specific cooperation period is disclosed, the alliance validity period is set accordingly; an alliance with a five-year validity period, for instance, is treated as existing from the starting year t through t+5. Drawing on the compiled results of these announcements, a dummy variable, Alliance, captures whether a firm takes part in a strategic alliance. It equals 1 when the listed company forms a strategic alliance with other companies during the year and 0 otherwise.

R&D Investment (RD). Following the research of Czarnitzki[38], R&D investment is measured as the natural logarithm of corporate R&D expenditure plus one. A larger value means the enterprise invests more in R&D.

R&D Personnel (TTRD). Following the research of Shefer[39], R&D personnel is measured as the ratio of R&D technical personnel to total enterprise employees.

4.2.4 Moderating Variable

Digital Transformation (DIG). Following the approach of Wu et al., the degree of corporate digital transformation is measured by how often relevant keywords appear in corporate annual reports. The keywords are sorted into two levels, "underlying technology research" and "technology practice research." The first level, "underlying technology application," centers on the four mainstream directions captured by the acronym ABCD, namely artificial intelligence, blockchain, cloud computing, and big data, while the second, "technology practice application," groups the core vocabulary of the various digital practice technologies. The two levels together form the keyword lexicon for corporate digital transformation.

4.2.5 Control Variables

Following existing research[40], the control variables cover three groups. The first group describes enterprise attributes: firm size (Size) and firm age (Age). The second covers financial characteristics: the asset-liability ratio (Lev), the revenue growth rate (Growth), and Tobin's Q (Tobinqa). The third covers ownership characteristics: the shareholding ratio of the largest shareholder (First), the proportion of independent directors (Indep), and the management shareholding ratio (Mshare). The variable definition table gives the specific definition of each variable[41].

4.3 Model Construction

To examine how managerial myopia affects corporate green innovation, Chinese listed enterprises in Shanghai and Shenzhen serve as the research object, and the panel data are analyzed by ordinary least squares (OLS) within a two-way fixed effects model. Robust standard errors are used by default in the regression tests. The model specifications are set out below.

Model 1 tests Hypothesis 1 and takes the following form:

$$GI_{i,t} = \alpha_0 + \alpha_1 Myopia_{i,t} + \Sigma\alpha_k Controls_{i,t} + \mu_t + \nu_j + \varepsilon_{i,t} \quad (1)$$

Models 2 and 3 test Hypotheses 2 and 3, the mediating effects. Following Wen and Ye[41], the models are constructed as follows:

$$MD_{i,t} = \beta_0 + \beta_1 Myopia_{i,t} + \Sigma\beta_k Controls_{i,t} + \mu_t + \nu_j + \varepsilon_{i,t} \quad (2)$$

$$GI_{i,t} = \gamma_0 + \gamma_1 Myopia_{i,t} + \gamma_2 MD_{i,t} + \Sigma\gamma_k Controls_{i,t} + \mu_t + \nu_j + \varepsilon_{i,t} \quad (3)$$

Models 4, 5, and 6 test Hypotheses 4, 5, and 6, the moderating effects, and take the following form:

$$GI_{i,t} = \delta_0 + \delta_1 Myopia_{i,t} + \delta_2 DIG_{i,t} + \delta_3 Myopia_{i,t}\times DIG_{i,t} + \Sigma\delta_k Controls_{i,t} + \mu_t + \nu_j + \varepsilon_{i,t} \quad (4)$$

$$SA_{i,t} = \delta_0 + \delta_1 Myopia_{i,t} + \delta_2 DIG_{i,t} + \delta_3 Myopia_{i,t}\times DIG_{i,t} + \Sigma\delta_k Controls_{i,t} + \mu_t + \nu_j + \varepsilon_{i,t} \quad (5)$$

$$RD_{i,t} = \delta_0 + \delta_1 Myopia_{i,t} + \delta_2 DIG_{i,t} + \delta_3 Myopia_{i,t}\times DIG_{i,t} + \Sigma\delta_k Controls_{i,t} + \mu_t + \nu_j + \varepsilon_{i,t} \quad (6)$$

where GI stands for corporate green innovation, Myopia for managerial myopia, MD for the three mediating variables of strategic alliance, R&D investment, and R&D personnel, and DIG for digital transformation; α_0, β_0, γ_0, and δ_0 are constant terms; the remaining symbols are coefficients; Control denotes the control variables; μ_t captures year fixed effects; ν_j captures industry fixed effects; $\varepsilon_{i,t}$ is the random error term; and the subscripts i and t index the firm and the year.

5. Empirical Results

5.1 Descriptive Statistics

Table 1 reports means, standard deviations, and correlation coefficients for the variables. Corporate green innovation has a mean of 0.814 and a standard deviation of 1.172, which points to wide differences among listed companies in how much green innovation they undertake. Managerial myopia shows a mean of 0.043 and a standard deviation of 0.037, so the degree of myopia also varies from firm to firm. No correlation coefficient exceeds 0.5 in absolute value, which means the estimates should not be distorted by high correlation among the variables. VIF values stay below 5 for every variable, providing further evidence that multicollinearity is not a serious concern.

Table 1: Descriptive Statistics and Correlation Coefficient Analysis

	GI	Myopia	RD	TTRD	SA	DIG	Size	Age	Lev	First	Tobinqa	Indep	Growth	Mshare
GI	1.000													
Myopia	-0.041	1.000												
RD	0.481	-0.049	1.000											
TTRD	0.158	-0.135	0.179	1.000										
SA	0.141	-0.066	0.152	0.080	1.000									
DIG	0.125	-0.138	0.162	0.372	0.154	1.000								
Size	0.437	0.120	0.524	-0.086	0.177	0.012	1.000							
Age	0.061	0.079	0.076	-0.047	0.146	0.025	0.184	1.000						
Lev	0.188	0.188	0.167	-0.111	0.089	-0.053	0.485	0.189	1.000					
First	0.029	0.056	0.021	-0.116	-0.095	-0.124	0.197	-0.107	0.039	1.000				
Tobinqa	-0.050	-0.023	-0.081	0.068	-0.003	0.012	-0.176	0.011	-0.064	-0.054	1.000			
Indep	0.028	-0.024	0.034	0.046	0.016	0.034	0.012	-0.005	-0.003	0.041	0.022	1.000		
Growth	-0.006	-0.003	-0.007	-0.003	-0.008	-0.003	0.010	0.008	0.013	-0.003	-0.001	-0.002	1.000	
Mshare	-0.062	-0.169	-0.070	0.120	-0.045	0.082	-0.283	-0.194	-0.270	-0.025	-0.004	0.084	0.002	1.000
Mean	0.814	0.043	17.790	21.760	0.420	12.330	22.140	2.869	0.420	34.370	2.161	0.376	1.141	0.077
SD	1.172	0.037	1.599	18.260	0.494	32.750	1.330	0.368	0.215	15.040	4.698	0.056	81.670	0.145

Note: A correlation coefficient above 0.08 in absolute value is significant at the 0.1 level and one above 0.016 is significant at the 0.05 level, both two-tailed.

5.2 Baseline Regression

Table 2 collects the regressions for the effect of managerial myopia on corporate green innovation together with the mediation models for strategic alliances and R&D investment. Column (1) includes control variables only. Column (2) reports the main effect once year and industry fixed effects are controlled. Columns (3) and (4) form the second step of the mediation test, where strategic alliances and R&D investment enter, and columns (5) and (6) form the third step.

Hypothesis 1 predicts a significant negative effect of managerial myopia on corporate green innovation. Columns (1) and (2) of Table 2 give the baseline estimates under the two specifications, and they show such an effect ($\beta = -0.554$, $p < 0.01$). The theoretical argument behind Hypothesis 1 therefore holds: managerial myopia holds green innovation back through crowding out resources and through managers' preferences over risk. H1 is supported.

Hypothesis 2 predicts that managerial myopia significantly reduces the formation of strategic alliances and that alliances mediate the link to corporate green innovation. Columns (3) through (6) of Table 2 report the stepwise regressions. Column (3) shows a significant negative effect of managerial myopia on alliance formation ($\beta = -0.477$, $p < 0.01$). Column (5) shows that myopia shapes green innovation partly through alliance formation, which is a partial mediating effect ($\beta = -0.353$, $p < 0.05$). Hypothesis 2 is thus confirmed.

Hypothesis 3 predicts a significant negative effect of managerial myopia on corporate R&D investment, with R&D investment mediating the link to green innovation. Column (4) shows the negative effect on R&D investment ($\beta = -1.913$, $p < 0.01$), and column (6) shows that myopia reaches green innovation partly through R&D investment, again a partial mediating effect ($\beta = -0.291$, $p < 0.05$). This confirms the argument behind Hypothesis 3: myopia distorts resource allocation and heightens risk aversion, which pulls R&D investment down and, indirectly, keeps green innovation in check.

A Sobel test was run next in order to give the mediation tests more statistical power. Strategic alliances and R&D investment each mediate the myopia-green innovation link significantly.

Table 2: Baseline Regression and Mediation Effects

	(1)	(2)	(3)	(4)	(5)	(6)
	GI	**GI**	**SA**	**RD**	**GI**	**GI**
Myopia		-0.554***	-0.477***	-1.913***	-0.353**	-0.291**
		(0.137)	(0.096)	(0.223)	(0.203)	(0.170)
SA					0.034**	
					(0.015)	
RD						0.175***
						(0.006)
Size	0.453***	0.447***	0.047***	0.926***	0.446***	0.352***
	(0.006)	(0.006)	(0.003)	(0.007)	(0.008)	(0.009)
Age	-0.054***	-0.045***	-0.037***	-0.226***	-0.070***	-0.036**
	(0.016)	(0.016)	(0.010)	(0.019)	(0.021)	(0.018)
Lev	-0.029	0.050*	0.079***	-0.614***	0.058	0.207***
	(0.027)	(0.027)	(0.019)	(0.046)	(0.036)	(0.032)
First	-0.000	-0.001	-0.002***	-0.000	-0.001***	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tobinqa	0.009**	0.009***	0.001	0.048***	0.007***	0.012***
	(0.004)	(0.003)	(0.001)	(0.008)	(0.002)	(0.003)
Indep	0.047	0.020	-0.127**	-0.174	0.290**	0.067
	(0.094)	(0.094)	(0.060)	(0.110)	(0.127)	(0.102)
Growth	-0.000	-0.000*	-0.000***	-0.001	-0.000**	-0.000
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
Mshare	-0.022	-0.032	-0.050**	0.338***	0.015	-0.001
	(0.034)	(0.034)	(0.024)	(0.034)	(0.046)	(0.035)
_cons	-9.100***	-8.964***	-0.412***	-1.761***	-8.936***	-9.971***
	(0.146)	(0.146)	(0.078)	(0.172)	(0.184)	(0.156)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
adj. R^2	0.409	0.404	0.163	0.570	0.417	0.439

Note: Standard errors appear in parentheses. Coefficients for hypothesis tests are one-tailed and those for control variables are two-tailed; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. N = 33,813.

5.3 Moderating Effect

Table 3 reports how digital transformation moderates the links between managerial myopia and, respectively, strategic alliances and R&D investment. Hypothesis 4 predicts that digital transformation positively moderates the myopia-green innovation relationship. The interaction of managerial myopia with digital transformation in column (1) carries a positive sign ($\beta = 0.016$, $p < 0.05$). The argument behind Hypothesis 4 is therefore borne out: by making resource allocation more efficient and cutting the uncertainty that surrounds the innovation process, digital transformation eases the crowding-out and risk-aversion effects that myopia has on green innovation. H4 is supported.

Hypothesis 5 predicts that digital transformation positively moderates the myopia-strategic alliance relationship. In column (2), the myopia-digital transformation interaction is positive ($\beta = 0.015$, $p < 0.01$). Digital transformation does appear to strengthen firms' capacity to form and sustain strategic alliances, mainly by allowing heterogeneous knowledge to be integrated efficiently and by making alliance governance more transparent. H5 is supported.

Hypothesis 6 predicts that digital transformation positively moderates the myopia-R&D investment relationship. Column (3) shows a positive interaction between managerial myopia and digital transformation ($\beta = 0.012$, $p < 0.05$). The mechanism behind Hypothesis 6 holds up: sharper allocation of R&D resources and a lower perceived risk of R&D investment together weaken the tendency of myopia to suppress R&D spending. H6 is supported.

Table 3: Moderating Effects

	(1)	(2)	(3)
	GI	**SA**	**RD**
Myopia	-0.419***	-0.411***	-1.809***
	(0.143)	(0.097)	(0.223)
DIG	0.002***	0.001***	0.002***
	(0.000)	(0.000)	(0.000)
Myopia×DIG	0.016**	0.015***	0.012**
	(0.008)	(0.004)	(0.007)
Controls	Yes	Yes	Yes
Year	Yes	Yes	Yes
Industry	Yes	Yes	Yes
adj. R^2	0.406	0.166	0.571

Note: Standard errors appear in parentheses; one-tailed tests apply to the hypothesis coefficients, two-tailed tests to the controls. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. N = 33,813.

5.4 Robustness Analysis

Replacing the dependent variable. Green patents come in two types, green invention patents and green utility model patents. The baseline regression uses the natural logarithm of the combined number of green invention and green utility model patent applications plus one as the dependent variable. As a check, the level of green innovation was re-measured in two ways: as the natural logarithm of green invention patent applications plus one, and as the natural logarithm of green utility model patent applications plus one. Columns (1) and (2) of Table 4 report the results, both significant at the 0.01 level; the findings stand.

Lagging by one period. Innovation tends to lag. Moving from a green innovation strategy and the associated investment to a filed green patent typically takes one to two years. The independent variable and the control variables are therefore lagged by one additional year, which reduces the chance that reverse causality is contaminating the causal inference. Column (3) of Table 4 reports the results, and they agree with the baseline regression, adding further support to the main conclusions.

Replacing the independent variable. Managerial myopia is measured a second way, as the ratio of corporate short-term investment to total assets. Text analysis picks up the short-term focus that management reveals in language and narrative, whereas the short-term investment ratio captures myopia directly from how management actually allocates resources, which avoids the impression management bias that text analysis may carry. Column (4) of Table 4 reports results consistent with the baseline regression, again supporting the main conclusions.

Table 4: Robustness Tests

	(1)	(2)	(3)	(4)
	Replace DV	**Replace DV**	**Lag One Period**	**Replace IV**
	Gfm	**Gsy**	**GI**	**Shortinv**
Myopia	-0.365***	-0.284***	-0.557***	-0.161**
	(0.117)	(0.111)	(0.151)	(0.098)
Controls	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
adj. R^2	0.348	0.368	0.409	0.410

Note: Parentheses contain standard errors. Hypothesis coefficients are tested one-tailed, control coefficients two-tailed. * p < 0.1, ** p < 0.05, *** p < 0.01. N = 33,813.

6. Conclusion and Discussion

6.1 Conclusion

The starting point for this paper is a gap in the literature: studies have seldom asked how the psychological characteristics of top managers relate to corporate green innovation. The paper therefore analyzes the effect of managerial myopia on green innovation and examines what strategic alliances and R&D investment do in between, along with the moderating part played by digital transformation. The findings are these. Managerial myopia restrains corporate green innovation. It reduces the formation of strategic alliances significantly, and alliances then carry part of its influence through to green innovation. It also reduces corporate R&D investment significantly, with R&D investment again acting as a channel. Digital transformation, for its part, moderates the myopia-green innovation relationship positively, and the same holds for the myopia-alliance and myopia-R&D relationships.

The paper speaks to two bodies of work, corporate green innovation and managerial psychological characteristics. Its first contribution is theoretical. Determinants of corporate green innovation have been traced to environmental regulations, the digital economy, ESG performance, and other sources, yet managerial psychology has received comparatively little attention. Management characteristics are known to shape corporate behavior, decision-making, strategy, and innovation outcomes; how managerial myopia, an important psychological trait, bears specifically on green innovation has remained unclear. By examining that link systematically, the paper helps to close the gap.

A second contribution comes from opening up the mechanism. The paper traces how managerial myopia works through alliance building and through the allocation of R&D resources. Prior work stresses that managerial decisions matter for green innovation, but it has not systematically shown how myopia travels through external cooperation and internal resource allocation. Bringing strategic alliances and R&D personnel into the framework yields an internal-external dual-driven mediation model, and that model makes the pathways from myopia to green innovation easier to see.

Third, by looking at digital transformation as a moderator, the paper sharpens the picture of the boundary conditions that govern the myopia-green innovation link. Digital tools, a comparatively recent feature of the corporate environment, supply precise decision support, yet they still depend on managers' strategic vision if green innovation and sustainable development goals are to be aligned. The results show a positive moderating role for digital transformation in the myopia-green innovation relationship and in the myopia-alliance and myopia-R&D relationships. One implication is that digital transformation helps management appreciate the long-term worth of green innovation, which softens the negative effect that myopia would otherwise have.

6.2 Managerial Implications

The findings carry practical lessons for firms. When myopia takes hold, decision-making tends to tilt toward short-term economic interests and long-term investment in green innovation suffers, which weakens a firm's capacity to develop sustainably. Firms should therefore put incentive schemes in place that make management value long-term strategic goals, and they should see to it that green R&D projects receive priority when resources are handed out. Steps of this kind serve corporate social responsibility and market competitiveness at the same time. The results also underline the mediating role of strategic alliances and R&D investment. Firms would do well to build alliance networks actively, to keep drawing in knowledge and technology from outside, and to raise R&D spending steadily so that green innovation has solid resources behind it. Finally, firms should pursue digital transformation with real commitment, using digital technologies to allocate resources more efficiently, to lower innovation risk, and to blunt the harm that managerial myopia does to green innovation.

6.3 Limitations and Future Research

Several limitations should be noted. Managerial myopia is a psychological characteristic, and measuring and defining it accurately has long posed difficulties for psychological research. This paper follows prior work in using a text-based managerial myopia indicator as a proxy; other measurement approaches deserve testing in future work so that these conclusions can be checked. The sample is also confined to Chinese A-share listed companies, which leaves out non-listed enterprises and limits how far the conclusions generalize. Non-listed companies could be brought into the analytical framework later on. Finally, the

paper looks at strategic alliances and R&D investment as the mediating channels; other mechanisms and boundary conditions, such as corporate culture and the intensity of environmental regulation, remain open for future research.

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