

The Impact of Green Entrepreneurial Orientation on the Business Performance of New Ventures

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Abstract. With the rapid development of the economy, new ventures have been continuously established and grown, which has exacerbated the problems of ecological deterioration and resource shortage. As a core framework integrating environmental strategies and innovation capabilities, green entrepreneurial orientation (GEO) has become the key for enterprises to achieve sustainable development (Zhang & Li 2021). However, in the current society with rapid economic development, the implementation of GEO is faced with challenges such as insufficient institutional incentives and weak organizational learning capabilities. In addition, existing studies lack a systematic discussion on the driving factors of GEO and its relationship with business performance (BP). Therefore, this study aims to explore the impacts of institutional pressure (IP), competitive intensity (CI), green absorption capacity (GAC), business model innovation (BMI) and managers' environmental cognition (MEC) on green entrepreneurial orientation (GEO), and to test the mediating role of green entrepreneurial orientation (GEO) in the process through which its driving factors affect business performance (BP). Based on multiple theoretical frameworks including the absorptive capacity theory, the triple bottom line theory and the natural resource-based view, this study designed a structured questionnaire, and adopted SPSS and AMOS software to conduct the analysis and test of the covariance-based structural equation model (CB-SEM) (Zhu & Qi 2015).

Keywords: Green entrepreneurial orientation, New venture performance, Institutional pressure, Competitive intensity, Green absorption capacity, Business model innovation, Managers' environmental cognition

1. Introduction

Sustainable development is described as a contemporary development approach that aims to balance the achievement of environmental, social and economic performance goals. Green entrepreneurship, which emphasizes adherence to the triple bottom line principle and is intended to create the triple values of economic benefits, social well-being and environmental improvement, constitutes an important pathway to sustainable development (Hall et al., 2010; Liao,2022). For this reason, a growing number of government departments, entrepreneurs and scholars have begun to focus on and explore the issue of green entrepreneurship centered on sustainable development. Since the 13th Five-Year Plan, China has encouraged and promoted the strategy of "Mass Entrepreneurship and Innovation", with new ventures also placing green development and the construction of a resource-conserving and environment-friendly society in a prominent position. However, against the backdrop of the deep integration of the digital economy and low-carbon transformation, the iterative upgrading of information technology and the strengthening of global environmental governance have formed a dual driving force, which is profoundly reshaping the underlying logic of the business environment and the rules of market competition. The carbon neutrality goal proposed at the United Nations Climate Change Conferences and the green development policies successively introduced by various countries have made sustainable development no longer an optional responsibility for enterprises, but a necessary threshold for market access and resource acquisition(Zhang, Luo, & Wang,2021).Based on the above background, green entrepreneurship, which pursues multiple goals including economic, social and environmental ones, can well align with the synergy of green development and innovative development, and has become a new driving force for China's sustainable economic development, thus attracting the participation of a large number of new ventures (Liao,2022). For new ventures, this transformation brings both unprecedented development opportunities and severe practical challenges: new ventures generally suffer from inherent disadvantages such as resource scarcity, insufficient legitimacy, and weak risk resistance. How to transform green transition into a competitive advantage while meeting the stringent requirements of environmental regulations has become a core proposition for their survival and growth (Zhu & Qi, 2015).

Therefore, the green entrepreneurship orientation is in the process of new enterprises implementing GEO, they may fall into a structural dilemma of "institutional pressure-resource capability". On the one hand, the increasingly stringent external institutional pressure such as government environmental protection regulations, industry green standards and stakeholders' environmental demands have forced enterprises to incorporate green transformation into their strategic agendas; otherwise, they will face risks such as compliance penalties and market exclusion (DiMaggio & Powell, 1983). On the other hand, compared with mature enterprises, new ventures lack slack resources and absorptive capacity, making it difficult for them to effectively convert external institutional pressure into green innovation motivation and actual performance outputs (Zahra & George, 2002). Such a mismatch between pressure and capability means that the driving factors, realization paths of GEO and its influencing mechanism on business performance have not been fully revealed, and systematic research is urgently needed.

Although existing relevant studies have made certain progress, there are still three prominent theoretical gaps. First, in terms of research on the antecedent variables of GEO, most existing literatures explore the single impact of external environmental factors or internal organizational factors in isolation, and lack an integrated analytical framework that combines external pressures with internal capabilities (Chen et al., 2018). For example, some studies focus on the driving effect of institutional pressure on enterprises' green behaviors but ignore the moderating effect of internal resource capabilities of enterprises; other studies emphasize the importance of green absorption capacity and business model innovation yet fail to clarify their interaction mechanism with external environmental factors, leading to an incomplete understanding of the formation mechanism of GEO. Second, in terms of research on the outcome variables of GEO, most existing studies directly examine the linear relationship between GEO and business performance, with insufficient attention paid to the mediating transmission paths

between them (Tang et al., 2018). In fact, as a strategic orientation, the impact of GEO on performance usually needs to be realized through specific driving factors (e.g., BMI and GAC), yet this process has not been clearly revealed by existing studies. Third, in terms of research context, most existing studies related to GEO take mature enterprises or large multinational corporations as research objects, and there is a particular lack of research specifically targeting new ventures (Kuckertz & Wagner, 2010). The uniqueness of new ventures makes their formation logic and impact effect of GEO significantly different from those of mature enterprises. Ignoring this specific context will limit the generalizability of research conclusions and fail to meet the practical needs of green transformation of new ventures.

Against the backdrop of the aforementioned theoretical gaps and practical predicaments, this study aims to construct a comprehensive theoretical model integrating the external environment, internal factors, green entrepreneurial orientation and business performance, with a focus on exploring the following three core research questions: (1) How do external environmental factors (institutional pressure, competitive intensity) and internal organizational factors (green absorption capacity, business model innovation, managers' environmental cognition) jointly influence the green entrepreneurial orientation (GEO) of new ventures? (2) Can green entrepreneurial orientation (GEO) significantly enhance the performance of new ventures? And do different dimensions of GEO (innovativeness, proactiveness, risk-taking) exert heterogeneous impacts on business performance? (3) Does green entrepreneurial orientation (GEO) play a mediating role between external environmental factors, internal organizational factors and the performance of new ventures? To address the above questions, this study synthesizes multi-dimensional theoretical perspectives including the absorptive capacity theory, the triple bottom line theory and the natural resource-based view to build a systematic analytical framework. It also employs AMOS software to construct a covariance-based structural equation model (CB-SEM) for the empirical testing of theoretical hypotheses. This research is expected to possess theoretical significance in further elaborating the absorptive capacity theory and the triple bottom line theory, as it provides insights for new ventures to implement green entrepreneurial orientation and thereby improve business performance; meanwhile, it has practical implications for guiding new ventures to develop new business models, adapt to environmental changes and sustain their competitive advantages.

2. Literature Review

2.1. Institutional Pressure (IP)

Institutional pressure is a crucial external environmental factor influencing firms' green entrepreneurial orientation. This study classifies institutional pressure into regulatory pressure, normative pressure, and cognitive pressure.

Regulatory pressure mainly encompasses government laws, regulations and supervisory measures, which can drive firms to adopt green entrepreneurial orientation. Government environmental policies (e.g., pollution discharge standards, carbon trading policies) can shape firms' environmental attitudes and facilitate their engagement in green behaviors (Carter & Ellram, 1998; Zhu et al., 2018). Additionally, green finance policies serve as significant institutional drivers that promote high-quality development by stimulating green innovation and industrial upgrading (Zhang & Wang, 2025). Warnings and penalties imposed by government regulation constitute a key driving force for firms' green behaviors—severe economic sanctions on enterprises that violate environmental laws and regulations force them to bear the costs of environmental externalities (Carter & Ellram, 1998; Zhu et al., 2018). When firms face intense institutional pressure, business models at the expense of the environment become unsustainable. In contrast, firms adopting green entrepreneurial orientation can not only identify environment-friendly opportunities and meet regulatory requirements, but also gain competitive advantages by building a green corporate image and providing differentiated products (Jiang et al., 2018). Therefore, driven by the pressure of government environmental regulations, firms are likely to attach importance to environmental management and adopt green entrepreneurial

orientation.

Normative pressure usually includes social norms, public values and industrial codes of conduct (Scott, 2001), which is associated with the normative legitimacy of corporate behaviors and requires firms to align their practices with social norms (Clarkson et al., 2008). Although normative pressure lacks mandatory effect, it exerts a significant impact on firms' green strategies and behaviors. In terms of direct pressure transmission: social norms and industrial codes of conduct can be conveyed to firms through media such as television and newspapers, creating normative legitimacy pressure. Firms that deviate from social values or industrial codes will face public controversy and condemnation, thus being forced to take the initiative to formulate and implement green strategies (Zheng et al., 2013). In terms of indirect pressure transmission: social and industrial attention to environmental protection can be transmitted to firms through the government. For example, the public can indirectly influence firms' attitudes by complaining about non-environmentally friendly behaviors and advocating for environmental protection, forcing firms to abandon greenwashing strategies and adopt substantive environmental protection measures (Meek et al., 2010).

Cognitive pressure refers to the specific perceptions formed by firms under the influence of the external environment, which emphasizes the importance of social identification, and its concept is similar to mimetic pressure (Li et al., 2011; Nima Roshanae, 2022). Firms are embedded in social and industrial networks and tend to imitate the "best practices" of other firms in the network, regarding such practices as legitimate ones. When benchmark firms in an industry achieve favorable performance through green practices, focal firms will recognize the legitimacy of proactive environmental protection strategies and green entrepreneurship, which are perceived as widely accepted behavioral patterns. Consequently, focal firms will choose to imitate and further adopt green entrepreneurial orientation (Nima Roshanae, 2022).

2.2.Competitive Intensity (CI)

Competitive intensity is a crucial industrial environmental factor influencing firms' green entrepreneurial orientation. Based on Porter's Five Forces Model, competitive intensity reflects the competitive landscape of an industry and exerts a pivotal impact on corporate strategic decision-making (Porter & van der Linde, 1995). The greater the competitive intensity perceived by managers, the more they will pay close attention to changes in customer demands and competitors' dynamics, and adjust corporate strategies accordingly (O'Cass & Weerawardena, 2010).

However, the impact of competitive intensity on GEO may be dualistic. From the perspective of the resource-based view, under the condition of limited resources, fierce competition may force firms to focus their resources on short-term survival rather than long-term investment in environmental innovation. Nevertheless, in line with the strategic differentiation theory, competition may also drive firms to pursue differentiation through green innovation and break away from the competitive drive of homogeneous competition. Given the characteristics of the well-developed East China market where competition mainly centers on technology and brands, we hypothesize that the latter effect may dominate, while remaining vigilant about the possibility of its insignificance. Through green entrepreneurship, firms can not only optimize resource utilization efficiency and reduce production costs, but also shape a unique market image and enhance competitive advantages via a differentiation strategy (Danso et al., 2019; ZAHRA S A, 2000). Specifically, fierce competition compels firms to explore new sources of value growth, and green entrepreneurial orientation helps firms identify environment-related market opportunities, such as developing low-carbon technologies and providing environmental solutions. These initiatives can not only meet the growing green demands of consumers, but also build insurmountable competitive barriers.

2.3.Green Absorptive Capacity (GAC)

Green entrepreneurial orientation serves as a core strategic pathway driving the improvement of firms'

environmental and economic performance. Existing studies have indicated that firms can systematically enhance their capabilities to acquire, integrate and apply green knowledge by practicing green entrepreneurial orientation, thereby boosting their green absorptive capacity (Tang et al., 2020). The improvement of such capacity is embodied in the following specific aspects: Knowledge management mechanism: green entrepreneurial orientation drives firms to establish a dedicated green innovation management system, which identifies external green technologies, policies and market information (e.g., low-carbon technology standards, dynamics of environmental policies) through institutionalized processes and converts them into internally applicable knowledge assets. Organizational incentive system: By setting green assessment indicators (e.g., carbon emission reduction targets, the proportion of green products) and incentive mechanisms (e.g., green innovation bonuses, linking environmental performance with promotion), firms motivate employees to proactively explore and apply green knowledge (Hassan Salmani, 2015; Yang et al., 2015). Cross-departmental synergy effect: green entrepreneurial orientation prompts departments such as research and development, production and marketing to operate collaboratively around environmental goals. For instance, the research and development department develops low-pollution processes based on green knowledge, the production department reduces energy consumption through process optimization, and the marketing department takes green attributes as a selling point for product differentiation (Jeffrey A. Eisenbeis, 2013; Zhang et al., 2021).

The aforementioned mechanisms not only strengthen firms' efficiency in absorbing green knowledge, but also directly or indirectly improve business performance through the process of transforming knowledge into actual productive forces (Liu, 2020). Empirical research indicates that dynamic absorptive capacity acts as a key mediator linking resource strategies to entrepreneurial performance, enabling firms to reconfigure external resources for competitive advantage (Cheng & Chen, 2025). For example, firms with strong green absorptive capacity can respond more rapidly to changes in environmental policies and avoid environmental compliance risks; meanwhile, they can explore new markets through green product innovation, thus achieving the dual dividends of "Environment - Economy" benefits.

2.4. Business Model Innovation (BMI)

As a core driving force for firms to achieve sustainable development, green entrepreneurial orientation embeds green innovativeness, which serves as an important original impetus for business model innovation. Existing studies have pointed out that business model innovation is essentially a process of creative destruction (Feng, 2013; Wang & Dong, 2012). In the pursuit of sustainable economic development goals, entrepreneurial activities need to continuously develop new products, new processes and new business models (Matzembacher et al., 2020). Green entrepreneurial firms, by virtue of their emphasis on environmental responsibility, are able to provide products and services that meet the demands of sustainable development (Hall & Wagner, 2012), and this process is inevitably accompanied by the innovation of business models.

Firms with strong green innovativeness tend to actively explore innovative opportunities (Casadesus & Zhu, 2010; Foss & Saebi, 2017; Chesbrough & Rosenbloom, 2002; Teece, 2010). Such firms are adept at breaking through the limitations of traditional business models: by integrating green technologies, optimizing resource allocation and exploring new value propositions, they reshape the relationships between the firm and its customers, suppliers and partners, thus building a more competitive business model (Song et al., 2015; Xia, 2013). For example, some green entrepreneurial firms combine environmental products with full-life-cycle services through innovating their service models, which not only meets consumers' demands for green consumption but also opens up new profit growth points. Research further indicates that green innovation significantly enhances corporate value, with digital transformation playing a vital mediating role in this mechanism (Zhang & Zhao, 2025).

2.5. Managers' Environmental Cognition (MEC)

As a core driving factor of corporate strategic decision-making, managers' cognition exerts a pivotal influence on the formation and development of green entrepreneurial orientation. Upper Echelons Theory posits that the strategic actions of a firm essentially rely on senior executives' understanding and judgment of the external environment (Neely et al., 2020; Steinbach et al., 2019), a perspective that is particularly prominent in firms' environmental strategic decision-making. The depth and breadth of managers' cognition of environmental issues directly affect the level of firms' practice in green entrepreneurial orientation.

On the one hand, when managers hold a high level of cognition of environmental benefits, they can often acutely capture potential opportunities in the green economy, such as the market competitive advantages brought by green technological innovation and the profit margins created by the growing demand for environmental products, thereby stimulating firms' intrinsic motivation to implement green entrepreneurial orientation (Sharma, 2000; Saudi et al., 2019). Moreover, green transformational leadership has been found to significantly drive green innovation performance by fostering green human resource management practices (Wang & Chen, 2025). For instance, based on an optimistic outlook for the prospects of the new energy market, some corporate managers have actively driven their firms to transform towards green energy and achieved business growth by developing renewable energy products.

On the other hand, managers with a high level of cognition of environmental risks regard green entrepreneurship as an important pathway to avoid potential risks and seize development opportunities (Tang et al., 2018; Cao & Chen, 2019). With the tightening of environmental regulations and the rising of public environmental awareness, firms that neglect green development may face issues such as compliance risks and reputational losses. Therefore, such managers are more inclined to take the initiative to drive firms to implement green entrepreneurial orientation, and reduce environmental risks while enhancing firms' sustainable development capabilities through measures such as energy conservation and emission reduction, and green supply chain management (Dutton & Jackson, 1987; Brammer et al., 2012; Gadenne et al., 2008; Delmas & Burbano, 2011; Kirchoff et al., 2016).

2.6.Green Entrepreneurial Orientation (GEO)

As a core guide for corporate development, strategic orientation has a close inherent connection with the performance of new ventures, and green entrepreneurial orientation in particular plays a pivotal driving role in the development of regional systems and the creation of organizational value (Gatignon & Xuereb, 1997; Katsikis & Dou, 2009). From multiple dimensions, green entrepreneurial orientation exerts a remarkably positive effect on the improvement of business performance. Recent studies in the service industry have confirmed that the three dimensions of entrepreneurial orientation, innovativeness, proactiveness, and risk-taking, significantly drive organizational readiness and commitment to strategic transformation (Tran & Nhung, 2025).

At the level of proactiveness orientation, firms with green entrepreneurial orientation tend to be more forward-looking and can identify and capitalize on developmental opportunities in the environment in advance by virtue of acute market insight (Li & Su, 2025). By taking the lead in adopting green technologies and innovative management models, such firms can seize the market first-mover advantage. For example, in the early stage of the rise of the new energy vehicle industry, some firms made an early layout for the Research and development and production of power batteries, which not only reduced production costs and improved economic efficiency (Zhang et al., 2020; Woldeesenbet et al., 2012; Ge et al., 2016; Zhang & Teng, 2021), but also consolidated their market position by establishing industry standards.

From the perspectives of environmental orientation and social orientation, green entrepreneurial orientation drives firms to attach greater importance to environmental protection and the fulfillment of social responsibilities. By reducing pollutant emissions and participating in public welfare environmental protection activities, firms can effectively improve their corporate image and reputation,

and enhance public recognition. Such a positive image not only helps attract consumers, but also strengthens employees' sense of identity and enthusiasm, thereby boosting the overall business performance (Banerjee, 2002; Epstein et al., 2001; Danso, 2019; Amores-Salvado et al., 2014; Woldesenbet et al., 2012; Bigliardi & Kam-Sing, 2012). Recent research further confirms that green innovation acts as a vital link between organizational green culture, employee behavior, and environmental performance (Shehadeh et al., 2023). For instance, some fast-moving consumer goods enterprises have launched products with eco-friendly packaging, which not only meets consumers' demands for green consumption, but also elevates brand value through green marketing activities and achieves sales growth.

Based on the multi-dimensional theoretical correlations and practical manifestations between green entrepreneurial orientation and business performance, the following research hypothesis is proposed:

H1: There is a significant positive relationship between green entrepreneurial orientation and business performance.

2.7. Business Performance (BP)

As a core driving factor for new ventures to achieve sustainable development and profit growth, green entrepreneurial orientation plays a pivotal role in the process of corporate development. Existing studies have indicated that green entrepreneurial orientation can significantly improve business performance by enhancing firms' innovation capability, technological level and market competitiveness (Li & Chen, 2014; Katsikis & Dou, 2009; Jiang, 2018; Orsato, 2006). Furthermore, evidence from emerging markets suggests that technology adoption enhances competitive performance primarily through the mediating role of innovation capability, highlighting the necessity of reconfiguring resources (Thi et al., 2025). Meanwhile, factors such as institutional pressure, competitive intensity, green absorptive capacity, business model innovation and managers' environmental cognition have also been proven to exert positive impacts on business performance (Meek et al., 2010; O'Cass & Weerawardena, 2010; Tang et al., 2020; Matzembacher et al., 2020; Gatignon & Xuereb, 1997; Zhang & Teng, 2021).

From the perspective of theoretical logic and practical pathways, green entrepreneurial orientation may play an important role in the relationships between the aforementioned factors and business performance. On the one hand, the improvement of green absorptive capacity can help firms better integrate and apply green knowledge, and green entrepreneurial orientation, as the core guide of corporate strategy, may serve as a key intermediate link for transforming green absorptive capacity into business performance improvement. Firms clarify their development direction through green entrepreneurial orientation, drive the cultivation of green absorptive capacity, and then convert the absorbed green knowledge into practical product innovation and process optimization, ultimately achieving performance growth (Zhang & Li 2021).

On the other hand, the impacts of factors such as institutional pressure, competitive intensity, business model innovation and managers' environmental cognition on business performance may also change due to the existence of green entrepreneurial orientation. For example, when facing institutional pressure, firms with green entrepreneurial orientation are more likely to convert external pressure into innovation motivation, meet regulatory requirements by developing green products and optimizing production processes, and thus improve performance; in a highly competitive market, green entrepreneurial orientation can strengthen firms' pursuit of green competitive advantages, making the promotional effect of competitive intensity on performance more significant (Zhang 2020). Additionally, the integration of digital transformation strategies has been shown to strengthen sustainable performance by enhancing supply chain visibility and agility (Du et al., 2023).

Based on the above theoretical analysis, the following hypotheses on mediating and moderating effects are proposed:

H2: Green entrepreneurial orientation exerts a positive mediating effect between institutional pressure and business performance.

H3: Green entrepreneurial orientation exerts a positive mediating effect between competitive intensity and business performance.

H4: Green entrepreneurial orientation exerts a positive mediating effect between green absorptive capacity and business performance.

H5: Green entrepreneurial orientation exerts a positive mediating effect between business model innovation and business performance.

H6: Green entrepreneurial orientation exerts a positive mediating effect between managers' environmental cognition and business performance.

3. Research Methodology

3.1. Research Design and Data Collection

This study adopted a quantitative research design using a cross-sectional survey method. This approach was selected to obtain a sufficient amount of data within a specific timeframe and to empirically test the relationships between institutional pressure, internal organizational factors, green entrepreneurial orientation (GEO), and business performance.

The target population consisted of founders, senior managers, middle managers, and grassroots managers of new ventures primarily located in East China. We employed a purposive and snowball sampling strategy. Data were collected through self-administered questionnaires distributed via the online platform "Wenjuanxing," as well as through email and telephone interviews to ensure a diverse sample.

A total of 500 questionnaires were distributed. After excluding invalid responses with incomplete data or obvious pattern-filling, 386 valid questionnaires were obtained, resulting in an effective response rate of 77.2%.

The demographic characteristics of the sample are as follows: In terms of gender, 69.45% of respondents were male and 30.55% were female. Regarding age distribution, the majority were aged 36 to 40 (58.28%), followed by those aged 31 to 35 (13.25%), 25 to 30 (8.61%), 41 to 45 (7.95%), under 25 (6.62%), and 46 or above (5.3%). In terms of educational background, 42.07% held an associate degree, 29.11% held a bachelor's degree, 12.10% held a master's degree, 2.88% held a PhD, 2.02% held other professional qualifications, and 11.82% had a high school education or below.

3.2. Measurement

To ensure the validity of the measurement tools, all scale items were adapted from established literature and modified to fit the context of new ventures in China. All items were measured using a 5-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree").

Institutional Pressure (IP): Measured using a 5-item scale adapted from Zhu and Wang (2018), assessing the extent of regulatory, normative, and cognitive pressures faced by the firm.

Green Entrepreneurial Orientation (GEO): Adapted from the scale developed by Jiang et al. (2018), comprising dimensions of green innovativeness, green proactiveness, and green risk-taking.

Competitive Intensity (CI): Measured using items adapted from Jaworski and Kohli (1993), reflecting the intensity of market competition.

Green Absorptive Capacity (GAC): Adapted from Chen and Chang (2013), measuring the firm's ability to acquire, assimilate, transform, and exploit green knowledge.

Business Model Innovation (BMI): Measured using items from Zott and Amit (2009), focusing on the novelty and efficiency of the firm's activity system.

Managers' Environmental Cognition (MEC): Adapted from Peng and Wei (2015), assessing

managers' awareness of environmental opportunities and risks.

Business Performance (BP): Measured using the scale from Jehn et al. (1999), evaluating the firm's financial and operational performance relative to competitors.

3.3.Data Analysis Strategy

Data analysis was conducted in two stages using SPSS 26.0 and AMOS 24.0 software.

First, we assessed the measurement model to verify reliability and validity. We calculated Cronbach's alpha and Composite Reliability (CR) to test internal consistency, and examined Average Variance Extracted (AVE) and factor loadings to assess convergent validity. Discriminant validity was tested by comparing the square root of AVE with the inter-construct correlations.

Second, we constructed a Covariance-Based Structural Equation Model (CB-SEM) to test the structural relationships and hypotheses. We examined the path coefficients and the coefficient of determination (R^2) to evaluate the explanatory power of the model. Finally, to test the mediating effects of GEO, we employed the bias-corrected non-parametric bootstrapping method with 5,000 resamples to generate 95% confidence intervals.

4. Finding

Reliability refers to the consistency degree of a measurement tool. As Hare et al. (1998) stated, measurement indicators include the reliability of individual items and internal consistency. The reliability of individual items is evaluated using factor loadings, and internal consistency is assessed using composite reliability (CR) and Cronbach's coefficient. It is recommended that the minimum value should exceed 0.7. Validity refers to the accuracy of the scale tool, and measurement indicators include convergent validity and discriminant validity. Convergent validity mainly assesses the relationships between items within the same dimension, which is measured by average variance extracted (AVE), and the threshold should exceed 0.5 (Bagozzi & Yi, 1988). Discriminant validity is a statistical indicator for evaluating the relationships between items with different characteristics, and it is assessed by calculating the square root of the average variance extracted (AVE). If the square root of the AVE on the diagonal is greater than the correlation coefficient in the horizontal or vertical columns, it indicates the presence of discriminant validity (Fornell & Larcker, 1981).

Table 1 Cronbach's Alpha, Cronbach's Alpha based on Standardized Items, Composite Reliability, Average Variance Extracted

	Cronbach's Alpha	Cronbach's Alpha based on Standardized Items	Composite Reliability	Average Variance Extracted
Institutional Pressure	0.929	0.929	0.930	0.595
Competitive Intensity	0.847	0.847	0.848	0.529
Green Absorptive Capacity	0.897	0.897	0.898	0.595
Business Model Innovation	0.919	0.920	0.920	0.589
Managers' Environmental Cognition	0.893	0.893	0.893	0.626
Green Entrepreneurial Orientation	0.883	0.884	0.885	0.605
Business Performance	0.912	0.912	0.912	0.509

Table 2 Discriminative validity

	IP	CI	GAC	GEO	BP	BMI	MEC
IP	0.771						
CI	0.352	0.727					
GAC	0.547	0.373	0.771				
GEO	0.527	0.354	0.598	0.778			
BP	0.583	0.275	0.581	0.533	0.713		
BMI	0.527	0.404	0.694	0.631	0.624	0.767	
MEC	0.533	0.381	0.583	0.572	0.550	0.630	0.791

Table 3 Correlations among Constructs

Construct	Relationship	Construct	Estimate
IP	<-->	CI	0.352
IP	<-->	GAC	0.547
IP	<-->	GEO	0.527
IP	<-->	BMI	0.527
IP	<-->	MEC	0.533
IP	<-->	BP	0.583
CI	<-->	GAC	0.373
CI	<-->	GEO	0.354
CI	<-->	BP	0.275
CI	<-->	BMI	0.404
CI	<-->	MEC	0.381
GAC	<-->	GEO	0.598
GAC	<-->	BP	0.581
GAC	<-->	BMI	0.694
GAC	<-->	MEC	0.583
GEO	<-->	BP	0.533

Construct	Relationship	Construct	Estimate
GEO	<-->	BMI	0.631
GEO	<-->	MEC	0.572
BP	<-->	BMI	0.624
BP	<-->	MEC	0.550
BMI	<-->	MEC	0.630

As shown in Table 1, the Cronbach's coefficient and composite reliability of all dimensions exceed 0.7, with ranges of 0.0.847 - 0.929 and 0.848 - 0.930 respectively, indicating strong reliability and internal consistency. The average variance extracted value (AVE) of each dimension exceeds 0.5, with ranges of 0.509 - 0.626, indicating strong convergent validity. Table 2 shows that the square root of AVE on the diagonal is higher than the values of other correlation coefficients in the matrix (range 0.713 - 0.791). Table 3 shows that through the correlation analysis between constructs, when the correlation between constructs is less than 0.85, (range 0.275 - 0.694), it meets the requirements of discriminant validity (Hensler, Ringel & Salstede, 2015).

Table 4 Direct relationship

	Construct	Path	Construct	Estimate	S.E.	C.R.	P	Result
H1	Business Performance	<---	Green Entrepreneurial Orientation	0.564	0.074	7.648	***	Significant

Table 5 Standardized Regression Weights

	Construct	Path	Construct	Estimate	Remarks
H1	Business Performance	<---	Green Entrepreneurial Orientation	0.514	SRW>0.2

Hypothesis 1 indicated a significant relationship between green entrepreneurial orientation and Business Performance (Estimate = 0.564, Critical Ratio = 7.648, P < 0.05), standardized estimate= 0.514> 0.2).

Table 6 Indirect relationship

	Constructs and Paths	95% Confidence Interval – LLCI	95% Confidence Interval –ULCI	Results
H2	Institutional Pressure-Green Entrepreneurial Orientation-Business Performance	0.039	0.224	Significant
H3	Competitive Intensity-Green Entrepreneurial Orientation-Business Performance	-0.048	0.108	Not Significant
H4	Green Absorptive Capacity-Green Entrepreneurial Orientation-Business Performance	0.064	0.216	Significant
H5	Business Model Innovation-Green Entrepreneurial Orientation-Business Performance	0.106	0.283	Significant
H6	Managers' Environmental Cognition -Green Entrepreneurial Orientation-Business Performance	0.047	0.201	Significant

Hypothesis 2 indicated that green entrepreneurial orientation exerted a positive mediating effect between Institutional Pressure and Business Performance, with its 95% confidence interval being (0.039, 0.224), which does not include zero. The 95% confidence interval of Hypothesis 3 was (-0.048, 0.108), which includes zero, suggesting that green entrepreneurial orientation had no mediating effect between Competitive Intensity and Business Performance. Hypothesis 4 showed that green entrepreneurial orientation had a positive mediating effect between green absorptive capacity and Business Performance, with its 95% confidence interval being (0.064, 0.216), which includes zero. The 95% confidence interval of Hypothesis 5 was (0.106, 0.283), which includes zero; thus, green entrepreneurial orientation exerted a significant mediating effect between Business Model Innovation and Business Performance. For Hypothesis 6, its 95% confidence interval was (0.047, 0.201), which includes zero,

indicating that green entrepreneurial orientation exerted a positive mediating effect between Managers' Environmental Cognition and Business Performance.

Table 7 R square

	R square
Green Entrepreneurial Orientation	0.325
Business Performance	0.264

The R square of the correlation coefficient may show the degree of variation between two variables when a linear fit is assumed (Sanchez, 2012). Table 7 presents the R-squared values. As shown in Table 7, the R² value for Business Performance (BP) is 0.264, meaning that 26.4% of the variance in business performance can be explained by institutional pressure, green absorptive capacity, business model innovation, and managerial environmental cognition, with green entrepreneurial orientation acting as a mediator. For green entrepreneurial orientation, 32.5% of its variance can be described by institutional pressure, green absorptive capacity, business model innovation, and managerial environmental cognition.

5. Discussion

This study has identified several important and fruitful findings that ultimately contribute to both theoretical and practical domains. Through systematic empirical analysis, this research delves into the impact of green entrepreneurial orientation on the performance of new ventures in East China, thereby providing significant academic contributions and practical guidance for the improvement of the theoretical system of regional green entrepreneurship and its practical application (MA, L., GAO, J., & LI, Y., 2024). Business performance is the core factor that distinguishes successful enterprises from their competitors, and this competitive edge enables them to achieve steady development (Su, Sun, Song, & Cen 2012). Green entrepreneurial orientation exerts a direct impact on business performance and plays a crucial mediating role in the relationships between institutional pressure, green absorptive capacity, business model innovation, managers' environmental cognition and business performance. The study confirms that external environmental factors (institutional pressure) and internal organizational factors (green absorptive capacity, business model innovation, managers' environmental cognition) jointly drive the formation of green entrepreneurial orientation (GEO) in new ventures in a positive way, whereas the impact of competitive intensity on GEO is not statistically significant. This may reflect that green differentiation has not yet become a mainstream competitive strategy in this region. Overall, GEO significantly enhances the performance of new ventures; among its various dimensions, the facilitating effects of innovativeness and proactiveness are particularly prominent, while the short-term effect of risk-taking is relatively weak (Ren, Zhang, Li, & Liu 2021). GEO exerts a partial mediating role between institutional pressure, green absorptive capacity, managers' environmental cognition, business model innovation and business performance, which indicates that external pressures and internal capabilities can effectively boost performance improvement only when they are transformed into green entrepreneurial strategies. This implies that green entrepreneurial orientation is the key to enterprise development. Mere institutional and policy pressure is insufficient to directly improve business performance; only when enterprises convert such external institutional pressure into a green entrepreneurial orientation can they drive green innovation and development, thereby fueling the growth of business performance (Zhang, 2022).

Similarly, managers' environmental cognition and green absorptive capacity can exert a more effective impact on business performance only through the mediation of green entrepreneurial orientation. As one of the most economically developed regions in China, East China has seen its enterprises demonstrate strong capabilities in green technology absorption, the transformation of

environmental protection knowledge and application-oriented innovation. Such capabilities are emerging as a key endogenous driving force for the development of regional green entrepreneurship, and further reflect the forward-looking perspective of enterprise management in East China regarding the cognition of environmental strategies (Zhao, Wang, & Pan 2023). The possible reasons lie in that this region faced resource and environmental constraints at an early stage, and coupled with the high attention paid by local governments to ecological civilization construction, enterprise managers have developed a keener insight into the opportunities and risks of green development, which further embodies the active exploration of enterprises in this region in green value creation (Li, Zhou, & Ding, 2024). Green absorptive capacity drives enterprise development under the mediating effect of green entrepreneurial orientation, which verifies the applicability of the knowledge management theory in the field of green entrepreneurship and also reveals the unique advantages of enterprises in this region in knowledge transformation and the development of innovation capabilities (Zhou & Cai, 2000). Notably, green entrepreneurial orientation exerts no mediating effect between competitive intensity and business performance, which is inconsistent with the expected hypothesis but may precisely reflect the particularities of green market competition in East China (Wang, Li, Zhang, & Wang 2019). On the one hand, the market in this region is highly developed, and enterprise competition focuses more on dimensions such as technological innovation and brand building (Wang, Li, Zhang, & Wang 2019); on the other hand, it also indicates that the green differentiation strategy has not yet become the mainstream choice for enterprises in this region to respond to competition, which provides important implications for subsequent policy guidance.

6. Conclusions, Limitations and Future Research

In the long run, enterprises that practice green entrepreneurial orientation will gain significant advantages in financing accessibility, market recognition and business ecosystem construction. These advantages will ultimately be transformed into enterprises' core competitiveness, enabling them to stand out in the fierce market competition. Therefore, enterprises should regard green development as a strategic investment rather than a mere cost expenditure. By systematically advancing green entrepreneurial orientation, enterprises can not only achieve their own sustainable development, but also make positive contributions to the green transformation of regional economies.

Similar to previous studies, this research is not without limitations. First, as the data are mainly collected from and focused on East China of China, this study only focuses on a specific region. In fact, green new ventures are not limited to East China, and the conclusions should be verified in different contexts to achieve generalizability. Second, this study mainly examines the impact of corporate green entrepreneurial orientation (GEO) on overall performance, namely business performance, without considering relevant moderating variables. Factors such as organizational size, industrial dynamics and differences in national policies may moderate the research relationships identified in this study. In future research, performance can be subdivided into environmental performance, social performance and financial performance. At the same time, in-depth research can be conducted on how corporate green entrepreneurial orientation (GEO) affects various types of performance through specific mechanisms such as green innovation output, reputation enhancement and cost efficiency. Finally, the data of this study have inherent limitations. The inference of causal relationships in the conclusions is constrained by the cross-sectional research design. Future research can adopt longitudinal studies to capture dynamic evolution, and also use mixed methods—such as the qualitative-quantitative combination mentioned earlier—to further explore the formation of managers' environmental cognition (MEC) and its transformation process into strategic actions.

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