ISSN:2790-1661 Volume-6-(2023)

An empirical study on the influencing factors of green entrepreneurship orientation -- A case study of Chinese manufacturing enterprises

Lihua Duan

Business Administration, Graduate School, Lyceum of the Philippines University, Manila. Code 1002

College of Innovation and Entrepreneurship, Anhui Technical College of Mechanical and Electrical Engineering, Wuhu, China

Correspondence: 479988748@qq.com

Address and contact information: Anhui Vocational College of Mechanical and Electrical Engineering, No. 16, Wenjin West Road, University Park, Wuhu City, Anhui Province, China, Postcode: 241002; Tel: 13675532699

Abstract. Although many scholars have discussed the green entrepreneurial orientation (GEO) of manufacturing enterprises, few studies have conducted systematic empirical analysis on the influencing factors of GEO. Based on relevant studies, this study took 219 manufacturing enterprises as research objects, and analyzes the formation mechanism and influencing factors of GEO in manufacturing enterprises from the macro, meso and micro levels. It is found that government compulsory regulation, government incentive regulation, market normative pressure, market imitative pressure, managers' environmental risk cognition and managers' environmental benefit cognition are important driving factors affecting manufacturing enterprises' green entrepreneurship orientation, and all have significant positive effects on manufacturing enterprises' GEO. The research conclusions further enrich the theoretical system of GEO, and have certain enlightenment for promoting the practice of green entrepreneurship in manufacturing enterprises. Manufacturing enterprises should cultivate and recruit managers with sustainable development concepts. The government should formulate incentives for manufacturing enterprises to implement GEO and gradually strengthen the publicity policy.

Keywords: Green entrepreneurial orientation (GEO), Manufacturing industry, Incentive regulation, Imitative pressure, Environmental risk cognition.

1. Introduction

The COVID-19 pandemic, food crisis, carbon emissions and other issues have once again stirred up a global wave of ecological and environmental protection, prompting a new round of thinking on how to further coexist in harmony between man and nature. Manufacturing industry has been directly related to a large amount of environmental pollution. Under the background of low carbon economy, it is urgent for manufacturing enterprises to assume environmental responsibilities. Therefore, in the process of commercializing, manufacturing enterprises need to keep in mind their core advantages and simultaneously adhere to the triple bottom line of economic, social and environmental aspects (Elkington,1997), so as to drive enterprises to implement green entrepreneurial-oriented strategies, promote enterprises to operate in a greener and more sustainable way, and stimulate their green entrepreneurial vitality. GEO is the latest and most significant topic in enterprise entrepreneurship and sustainable development (Habib, Yu & Aboobucker, 2020). The manufacturing industry is a relatively mature industry, and the survival and development of new enterprises need to have certain advantages. The implementation of green entrepreneurship-oriented strategy can help new enterprises quickly seize green business opportunities, gain advantages, better adapt to environmental changes, and transform various resources into productivity. The existing researches on GEO mainly focus on the definition of concept, dimension division and the exploration of the correlation between GEO and enterprise performance. Although scholars have

discussed many driving factors of green entrepreneurship orientation, the existing research only studies the influence of a single or several key factors on GEO, which is not enough to clearly explain the impact of three or more variables. In order to fill the research gap above, it is necessary to empirically analyze the driving factors of GEO by taking Chinese manufacturing enterprises as an example. Based on the original research results on GEO, this study proposed the research hypothesis on the impact of government compulsory regulation, government incentive regulation, market normative pressure, market imitative pressure, managers' environmental risk cognition and managers' environmental benefit cognition on GEO from the macro, meso and micro levels. And explored the influencing factors of GEO of manufacturing enterprises by building a model. To deepen the theoretical research on green entrepreneurship of manufacturing enterprises and provide the basis for the practice of green entrepreneurship.

2. Literature Review

2.1 Connotation and dimension of GEO

The concept of GEO is based on the combination of entrepreneurial orientation and green entrepreneurship. An earlier concept related to GEO is sustainable entrepreneurship orientation, which refers to the tendency of enterprises to identify, evaluate and utilize economic opportunities in order to improve environment-related market failures (Dean & McMullen,2007). Jiang et al. believe that GEO means that enterprises solve environmental issues concerned by relevant stakeholders by carrying out practice activities that break through traditions and have certain risks. In other words, enterprises with high GEO should not only abide by environmental laws and regulations, but also follow the strategic direction of enterprise operation and management (Jiang, Chai, Shao & Feng, 2018).The introduction of this concept indicates that in the face of increasingly urgent environmental challenges, green entrepreneurial-oriented strategies become the solution rather than the cause of environmental degradation, and that enterprises can take advantage of the opportunities inherent in environment-related market failures to reduce environmental degradation and gain profit opportunities at the same time. Zhang et al. believe that GEO reflects an enterprise's strategic attitude, values and management behavior (Zhang & Li, 2021). Manufacturing enterprises with green entrepreneurship orientation solve environmental problems by creating green products, processes and services. The definition of GEO by many scholars is mainly reflected in two aspects. In one aspect, enterprises need to assume the social responsibility of environmental protection while realizing economic benefits; In a further aspect, the environmental factors are regarded as business opportunities to enhance the economic benefits of enterprises as competitive advantages. The objective of this empirical analysis is to explore the antecedent variables of GEO, focusing on the macro, meso and micro factors of new manufacturing enterprises. Combined with the above definition and the purpose of this study, the GEO is defined as the strategic orientation of products, services and technological innovation in line with the environmental requirements formulated by enterprises in pursuit of win-win business and environmental benefits. This concept is not only the embodiment of corporate sustainable strategy, but also combines the connotation of green and entrepreneurial orientation.

On the dimension division of green entrepreneurship orientation, there is no universally agreed normative in the academic circle, but it mainly includes the following types. Miller et al. believe that the development of green value concepts, research and development activities, the launch of green new products, the willingness and foresight to quickly identify and grasp green business opportunities, as well as a certain risk bearing capacity are the keys to green entrepreneurship, namely innovation, initiative and risk bearing (Miller & Friesen, 1983). Li et al. regard GEO as a separate system, which operates through a unique organizational operation process and strategic decision-making mode, and divides GEO into two basic dimensions of sustainability and development (Li & Chen, 2014). While emphasizing enterprises' green innovation and taking the lead to win green competitive advantages, Xia Han pays more attention to the ability of green

entrepreneurial activities to solve environmental and social problems. He believes that GEO is characterized by innovation, initiative, sociality and ecology (Xia, 2019). Zhang et al proposed the measurement dimensions of GEO are mainly divided into green innovation, green initiative and risk taking (Zhang & Li, 2021). Combined with the research purpose, this study draws on the above research results to measure the GEO from the dimensions of green innovation, initiative, social and environmental.

2.2 Driving factors of GEO

The driving factors of green entrepreneurship orientation mainly include social factors and environmental factors, and different scholars have different research perspectives. One is business ethics. Business ethics refers to the moral norms and codes of conduct that enterprises should follow in the process of operation. Business ethics is not something that only a large company needs to pay attention to. Any company has to face business ethics issues in the process of operation. Ma et al proved through empirical analysis that business ethics can promote the implementation of green entrepreneurship orientation by enterprises, and that policy support and the relationship network between enterprises and local governments and non-governmental sectors are also of great significance for the initial development of enterprises (Ma & Ma, 2018). Second, government environmental regulation. Government environmental regulation means that enterprises must take into account the impact on the external environment when operating activities. Li concluded through research that institutional regulatory environment can positively regulate the level of environmental incentives, and government policy incentives can also promote the development of green entrepreneurship-oriented strategies (Li, 2015). Preferential policies such as fiscal support and tax breaks encourage enterprises to adopt a GEO, while actively adjusting environmental regulation are factors that promote enterprises to adopt a GEO. Third, market demand. Xia pointed out that green entrepreneurship is closely related to market demand, so it was necessary to regulate enterprise economic activities and guide enterprise green entrepreneurship based on market demand pressure (Xia, 2019). Fourth, corporate managers' environmental cognition. Cui et al. found in their research that paying attention to ecological value, government environmental policies and enhancing green entrepreneurship awareness have significant influence on green entrepreneurship intention (Cui & Yang, 2015). Therefore, in the study on the antecedent factors of green entrepreneurship orientation, Gast et al. categorize these drivers into three categories, including micro personal values and ideals of entrepreneurs, medium external pressures of market participants, and macro political and institutional legislation (Gast, Gundolf & Cesinger, 2017); Gao et al. summarized entrepreneurial motivations of green entrepreneurs into four aspects: law, economy, values and individuals (Gao & He, 2011). Combined with the above scholars' views, this study adopts literature induction and empirical research method to empirically analyze the influencing factors and antecedent variables of green entrepreneurship-oriented strategy from micro, meso and macro levels.

3. Model Construction and Hypothesis

3.1 Macro level: government environmental regulation

Government environmental regulation means that in order to protect the external natural environment, the government directly or indirectly controls, intervenes and incentivifies the entire operation process of enterprises by issuing a series of laws, regulations and codes of conduct, mainly including environmental protection laws, policies, management regulations and measures (Zhang, Liang, Feng, Yuan, & Jiang, 2020). Government intervention is an ideal mechanism to solve environmental problems (Jeffrey & Venkataraman, 2009). It is found that environmental regulation has both pulling and promoting effect on enterprises' adoption of green entrepreneurship-oriented strategy. The stronger the incentive level of environmental regulation, the lower the cost of enterprises' adoption of green entrepreneurship-oriented strategy, the stronger the

expected competitive advantage, and the more willing enterprises are to adopt environmental strategy (Li, 2015). The greater the government's support for green entrepreneurship and the stronger the control over environmental damage, the stronger the entrepreneur's willingness to implement green entrepreneurship strategy (Horisch, Kollat & Brieger, 2017). In addition, in addition to encouraging green entrepreneurship through the enactment of environmental protection laws and regulations, the government also controls key resources for the operation and development of manufacturing enterprises, such as licenses, land and tax incentives, and forces enterprises to shift from traditional pollution-oriented entrepreneurship to green entrepreneurial behaviors by changing the supply-demand relationship (Cui & Yang, 2015) (Cui & Yang, 2015).Thus, the following hypothesis is proposed:

Hypothesis (H1). Government compulsory regulation has a significant effect on enterprises' GEO.

Hypothesis (H2). Government incentive regulation has a significant effect on enterprises' GEO.

3.2 Meso level: market pressure

The concern of customers, competitors and other stakeholders on corporate environmental performance will form market pressure (Tang & Tang, 2012). As a kind of market signal, such pressure can reduce the level of uncertainty involved in green business behavior. Thus influencing the decision of enterprises to adopt green entrepreneurship-oriented strategy (Eiadat, Kelly, Roche & Eyadat, 2007). From the perspective of regulatory pressure, Lewis et al. identified two main reasons for organizations to focus on providing green products (Lewis & Harvey, 2010). First, end consumers are increasingly demanding green products, and second, customers and retailers from the green supply chain are under great pressure. Thus, market demand has become the main normative pressure for corporate environmental initiatives (Zhu & Sarkis, 2007). Zameer et al. found that customer pressure plays a bigger role in green production of Chinese manufacturing enterprises than government regulation on ecological environment (Zameer, Wang & Yasmeen, 2019). Some enterprises implement environmental protection measures, mainly because of the demand from customers for green products. From the perspective of imitative pressure, environmental practice has become a key path for an enterprise to gain characteristic advantages over its competitors, especially under the background of increasingly high product quality and better service quality of existing enterprises.

On the one hand, the pressure from competitors will affect the internal green activities of enterprises. After observing that competitors benefit from the implementation of environmental management activities, enterprises usually increase internal integration efforts to cope with competitors' environmental pressure (Dai, Cantor & Montabon, 2015). The more intense the competition environment, the more inclined enterprises are to implement internal green practices (Li & Xu, 2017). On the other hand, imitation pressure will also affect the green external integration of enterprises. According to the social contagion theory, the interaction between enterprises and suppliers is a cohesive mechanism that promotes the diffusion of similar behaviors (Huo, Li & Zhao, 2018). Therefore, enterprises will pass on the perceived pressure from competitors to suppliers and deal with the threat of competitors through green supplier integration (Zhao, Feng, Xin & Hao, 2020). Therefore, the following hypothesis is proposed:

Hypothesis (H3). Market normative pressure has a significant effect on enterprises' GEO.

Hypothesis (H4). Market imitative pressure has a significant effect on enterprises' GEO.

3.3 Micro level: managers' environmental cognition

As the micro-subject of environmental management, enterprise managers' cognition of environmental problems can affect enterprises' environmental behavior. Managers' environmental cognition is managers' interpretation and recognition of whether ecological environmental problems are opportunities or threats (Deng, Liu, Long, Lin, Yang & Munkhbayar, 2021). Due to the uncertainty of external environment, managers usually make strategic choices based on the

cognition, identification, attention and utilization of enterprise capability resources and external environment. Sharma's research shows that enterprises constantly seek for competitive advantages. To some extent, if managers believe that ecological environmental problems can bring development opportunities rather than threats to enterprises, they will guide enterprises to participate in the research and development of environmentally friendly products and processes (Sharma, 2000). As the micro-subject of environmental management, managers make strategic decisions on whether to be green based on the perception of external friendly environment and challenges, thus affecting the environmental behaviors of enterprises (He, Huang & Chen, 2017).

Managers' environmental cognition is an important influencing factor for enterprises to adopt green entrepreneurship-oriented strategies. When managers believe that natural environmental problems are development opportunities for enterprises, it is easier to implement forward-looking environmental strategies. On the other hand, the cognitive view of managers holds that the occurrence of strategic change is directly affected by the cognitive ability of managers. Only when the self-awareness of managers changes, the strategic formulation of enterprises is likely to change; otherwise, the change of environment cannot directly affect the formulation of corporate strategies (Nadkarni & Barr, 2008). Thus, the following hypothesis is proposed:

Hypothesis (H5). Managers' environmental risk cognition has a significant effect on enterprises' GEO.

Hypothesis (H6). Managers' environmental benefit cognition has a significant effect on enterprises' GEO.

Through literature review, it is not difficult to find that green entrepreneurship orientation is a complex and comprehensive choice. Government environmental regulation, market pressure and managers' environmental cognition play an important role in the formation of green entrepreneurship orientation, and a research framework is constructed, as shown in Figure 1.

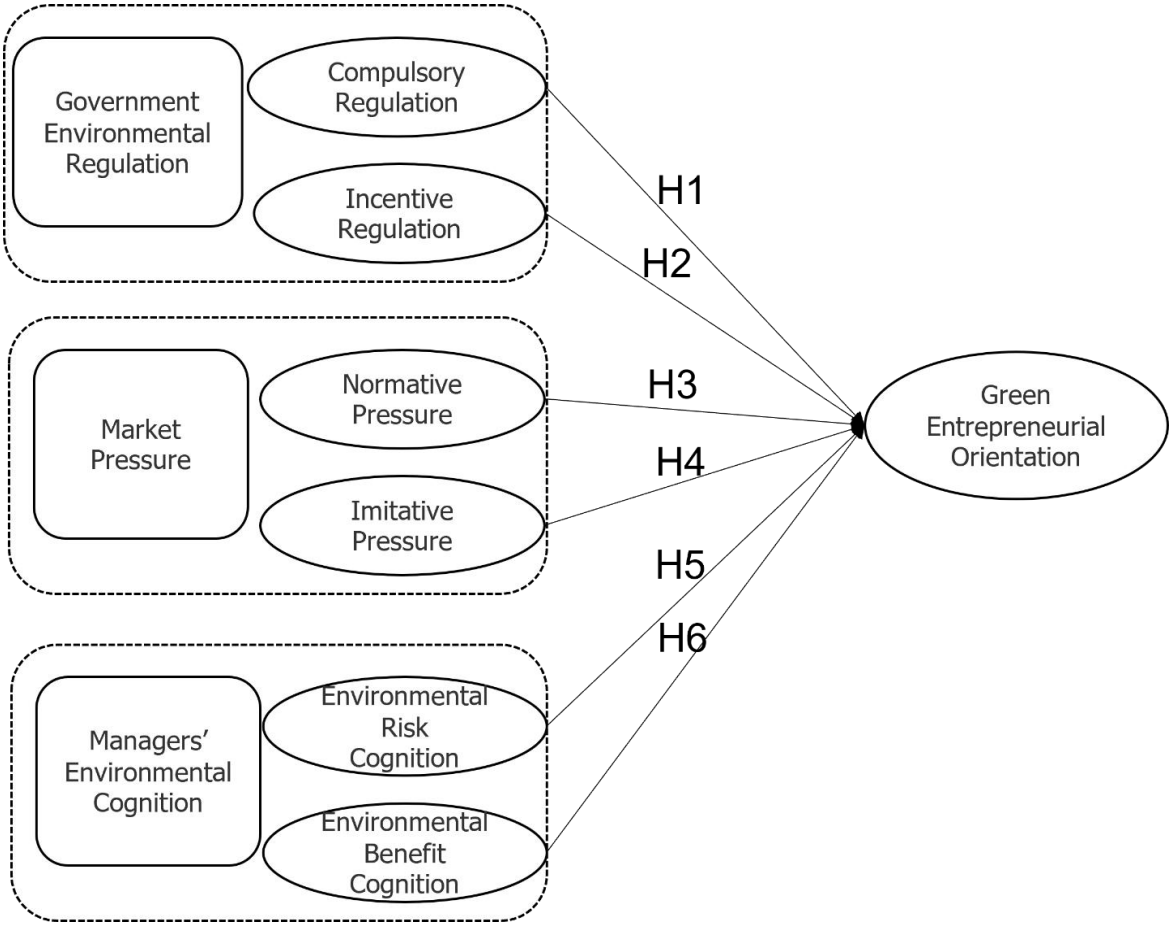

Fig. 1 Model structure of influencing factors of green entrepreneurship orientation

4. Reaearch Design

4.1 Sample selection and data collection

China's Yangtze River Delta (YRD) and Pearl River Delta (PRD) are experiencing rapid economic development, highly degree of industrialization, advanced manufacturing and great pressure on environmental protection, which can better reflect the basic situation of China's manufacturing industry in terms of environmental protection. Thus, the study selects manufacturing enterprises in the YRD and PRD for investigation, aiming to accurately understand the information on the orientation of manufacturing enterprises in terms of green entrepreneurship. This study conducted a questionnaire survey from March 2022 to July 2022, lasting for 4 months. A total of 360 questionnaires were sent out, 274 were recovered, and 219 were valid. Among the surveyed enterprises, 53.4% are from the YRD, and 46.6% are from the PRD. The enterprises with an age of less than 5 years account for 26% of the total number of subjects, 22.4% for 5 to 10 years, 27.4% for 11 to 15 years, and 24.2% for more than 15 years. The basic information of the surveyed manufacturing enterprises is shown in Table 1.

Table 1 Distribution of survey samples

Characteristics	Classification	%
Industry	Electronic communication equipment manufacturing	13.7
	Instrument manufacturing industry	12.4
	Food and beverage manufacturing	12.3
	Machinery and equipment manufacturing	10.5
	Furniture manufacturing industry	9.1
	Automobile manufacturing industry	8.2
	Petroleum chemical industry	8.2
	Textile service industry	6.9
	Pharmaceutical manufacturing industry	6.4
	Chemical manufacturing industry	5.5
	Other	6.8
Enterprise nature	State-owned enterprises	21.0
	Sino-foreign joint venture enterprise	17.8
	Wholly foreign-owned enterprise	11.9
	private enterprise	47.5
	Other	1.8
Enterprise size/person	＜100	26.9
	100～499	21.9
	500～999	25.2
	＞1000	26.0

4.2 Measurement of variables

This study draws on the mature scale published in the relevant research results of high-level journals at home and abroad, and combines with the practice of manufacturing enterprises in the context of China to make appropriate modifications, and finally determines the formal questionnaire, and adopts the Likert five-point scale for measurement. In AMOS model analysis, measurement variables are usually divided into antecedent conditions and outcome variables. Therefore, government environmental regulation, market pressure and managers' environmental cognition are taken as antecedent conditions, and GEO is taken as outcome variables. By referring to relevant research results, the green entrepreneurship orientation is measured from the dimensions of green innovation, initiative, sociality and environmental characteristic, with a total of 5 items. The government environmental regulation variables are divided into compulsory regulation and incentive regulation to measure, with a total of 6 items. The market pressure variable is summarized into two key dimensions, normative pressure and imitative pressure, with a total of 6 items for measurement. The environmental cognition of managers is divided into environmental risk cognition and environmental benefit cognition, with a total of 8 items, as shown in Table 2.

Table 2 Measurement dimensions of variables

Variables		Observable variable variables	Source
Y1 Green Entrepreneurial Orientation（GEO）		GEO1: The company attaches great importance to green research and development, green technology leadership and innovation (X1)	Jiang et al., 2018; Zhang & Li, 2021
		GEO2: The company is the first to examine industry trends and the first to introduce green products, services or technologies (X2)	
		GEO3: Compared with competitors, the company pays more attention to improving the overall awareness of green environment protection (X3)	
		GEO4: Company sees high return opportunities in high risk green product development projects (X4)	
		GEO5: The Company's Active commitment to Social Management and solving Social Problems (X5)	
Government Environmental Regulation	Y2 Compulsory Regulation（CR）	CR1: The production of the company shall comply with relevant domestic environmental laws and regulations (X6)	Li & Ye, 2011; Cao & Chen,2017
		CR2: The production of the company shall meet the requirements of international environmental normative (X7)	
		CR3: The company's products must comply with international environmental Convention normative (X8)	
	Y3 Incentive Regulation（IR）	IR1: The government has provided subsidies related to the implementation of environmental protection measures for our company (X9)	
		IR2: The government has reduced the tax on the implementation of environmental protection measures related to our company (X10)	
		IR3: The government's promotion of environmental protection has had a positive impact on our company (X11)	
Market Pressure	Y4 Normative Pressure（SP）	NP1: The market in which the company operates Trade associations/professional associations encourage enterprises to adopt environmentally friendly behaviors (X12)	Chen, Zhu & Guo, 2018; Xu, Guan & Lin, 2017
		NP2: Customers in the industry expect companies in the industry to adopt environmental measures (X13)	
		NP3: Environmental responsibility is a basic requirement for all companies entering the industry in which they operate (X14)	
	Y5 Imitative Pressure (IP)	IP1: Our competitors have successfully adopted cleaner production technology (X15)	
		IP2: Substitutes for the company's products have successfully adopted industry-leading environmental technology (X16)	

		IP3: Industry leaders have successfully adopted industry-leading environmental processes (X17)	
Managers' environmental cognition	Y6 Environmen-tal Risk Cognition (ERC)	ERC1: The company's top management team is committed to environmental protection (X18)	Peng & Wei, 2015; Zhao et al., 2020
		ERC2: The company's environmental efforts are fully supported by senior management (X19)	
		ERC3: The Company's environmental strategy is driven by the senior management team (X20)	
		ERC4: The company is well aware of the best environmental practices in the industry (X21)	
	Y7 Environmen-tal Benefit Cognition (EBC)	EBC1: The top management of the company believes that green environmental protection behavior can improve the economic performance of the enterprise (X22)	
		EBC2: The top management of the company believes that green environmental protection behavior can improve the environmental performance of the company (X23)	
		EBC3: Top management of the company believes that green environmental protection behavior can improve enterprise production efficiency (X24)	
		EBC4: The top management of the company believes that green environmental protection behavior can improve the comprehensive competitiveness of the enterprise (X25)	

4.3 Reliability and validity test

SPSS24.0 and Amos24.0 software were used to analyze the reliability and validity of the scale. The Cronbach's α coefficients and the combination reliability (CR) of variables are all higher than 0.7. The mean extraction variance (AVE) of all constructs was above 0.5 in Table 3, which proved that the selected variables had good structural reliability and validity.

Validity reflects whether the questionnaire can accurately measure the degree of measurement required. Questionnaires are usually tested for content validity and structure validity. In terms of content validity, the scale widely used in GEO was used to compile and form the questionnaire. The questionnaire validity test sheet was sent to the representatives of successful entrepreneurs and managers. The language of the questionnaire was modified according to the opinions, and some inappropriate items were deleted to enhance the effectiveness of the scale in terms of structure.

Table 3 Reliability and validity analysis of variables

Variables		Measurable Factors	Factor Loading	Number	Cronbach's alpha	CR	AVE
Green Entrepreneurial Orientation		GEO1 GEO2 GEO3 GEO4 GEO5	0.772 0.834 0.721 0.760 0.730	5	0.821	0.801	0.584
Government Environmental Regulation	Compulsory Regulation	CR1 CR2 CR3	0.853 0.800 0.818	3	0.762	0.764	0.509
	Incentive Regulation	IR1 IR2 IR3	0.803 0.836 0.817	3	0.751	0.738	0.503
Market Pressure	Normative Pressure	NP1 NP2 NP3	0.737 0.851 0.848	3	0.743	0.735	0.500
	Imitative Pressure	IP1 IP2 IP3	0.798 0.847 0.855	3	0.780	0.745	0.521

Managers' environmental cognition	Environmental Risk Cognition	ERC1 ERC2 ERC3 ERC4	0.710 0.738 0.790 0.728	4	0.725	0.782	0.551
	Environmental Benefit Cognition	EBC1 EBC2 EBC3 EBC4	0.744 0.819 0.846 0.718	4	0.788	0.797	0.614

4.4 Fitting test of structural equation model

Good fitting degree is a necessary condition for SEM analysis. AMOS24.0 and the most approximate approximation method were used to test the structural equation model fitting. The absolute fit index x 2/df, RMSEA, GFI, reduced fit index PNFI, PCFI, and Incremental fit index CFI, TLI, IFI selected by the fit degree test were all in line with the suggested values of the test (Table 4), indicating that the constructed model had a good fitting effect and no further modification was needed.

Table 4 Fitting index values of the overall model

The goodness of fit indices	Measured index	Criteria	Goodness of fit
Absolute fit indices	x2/df	＜2	1.081
	RMSEA	＜0.08	0.019
	GFI	＞0.9	0.905
Reduced fit indices	PNFI	＞0.5	0.752
	PCFI	＞0.5	0.884
Incremental fit indices	CFI	＞0.95	0.986
	TLI	＞0.95	0.984
	IFI	＞0.95	0.986

5. Research Results and Discussion

5.1 Results

AMOS24.0 software was used to calculate the specific effects among seven latent variables in the structural equation, namely GEO, compulsory regulation, incentive regulation, normative pressure, imitative pressure, environmental risk cognition and environmental benefit cognition, as shown in Figure 2. First, compulsory regulation and incentive regulation have significant influence on green entrepreneurship orientation, and the path coefficients are 0.14 and 0.28, respectively ($p<0.01$), so hypothesis H1 and H2 are valid. Second, normative pressure and imitative pressure are positively correlated with GEO, with path coefficients of 0.24 and 0.25, respectively ($p<0.01$), so H3 and H4 were assumed to be valid. Thirdly, environmental risk cognition and environmental benefit cognition have significant influence on green entrepreneurship orientation, and the path coefficients are 0.38 and 0.25, respectively ($p<0.01$), so hypothesis H5 and H6 are valid. Fourthly, by comparing the path coefficients of each dependent variable, it is found that the influences on GEO from strong to weak are environmental risk cognition, incentive regulation, environmental benefit cognition, imitative pressure, normative pressure and compulsory regulation, which proves that managers' environmental cognition plays a key role in enterprises' green strategy development, followed by government regulation. Finally, there is market pressure.

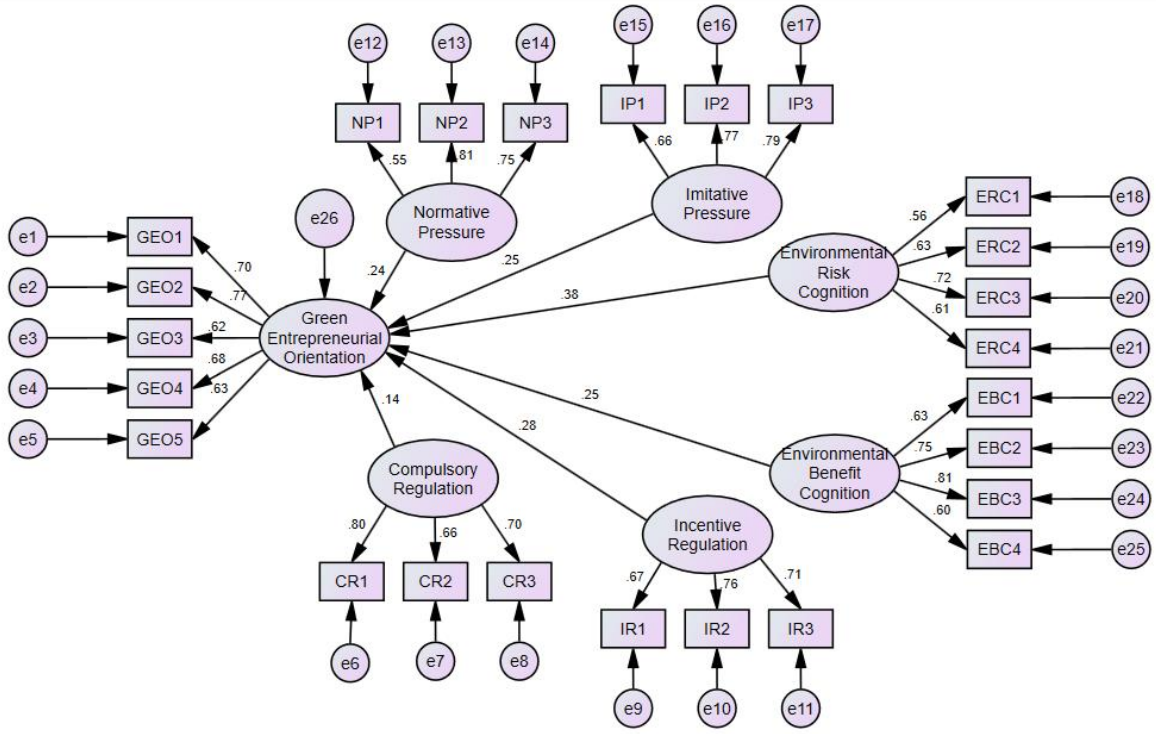

Fig. 2 Path coefficient estimation of the influence mechanism of green entrepreneurship orientation

5.2 Discussion

First, among the influencing factors discussed in this study, managers' environmental cognition is the primary condition to promote enterprises' implementation of green entrepreneurship-oriented strategy. In particular, managers' cognition of environmental risks has a profound effect on the green entrepreneurship-oriented of enterprises. Enterprise managers with high green entrepreneurship orientation will infiltrate green concepts into enterprise management to take the road of green entrepreneurship. Therefore, it is very important for enterprises to introduce and cultivate managers with green entrepreneurial vision.

Second, government regulations on the environment also have a certain impact on whether enterprises implement green entrepreneurial-oriented strategies, but the influence of incentive regulations is greater than that of compulsory regulations. Therefore, the government must further promote policies, introduce mechanisms to encourage manufacturing enterprises to carry out green entrepreneurship, and enhance the enforceability and operability of policies.

Third, not all influencing factors have positive effects, only manufacturing enterprises can realize green entrepreneurship orientation. Enterprises adopting green entrepreneurship orientation can contribute to excellent environmental performance through various mechanisms. Managers' awareness of the environment, government environmental regulation and market pressure can be combined to a certain extent, which will certainly have a greater impact on enterprises' green entrepreneurship. Enterprise managers need to gather together and work together. Through brainstorming, consulting industry reports and other methods, they can understand the changes in external environment, analyze opportunities and challenges through swot, and formulate countermeasures.

Therefore, the empirical study shows that government environmental regulation, market pressure and managers' environmental cognition can affect the formation of GEO of manufacturing enterprises. Positive environmental cognition of managers means that they believe that profit maximization is not the sole responsibility of enterprises, and that green entrepreneurship can bring expected competitive advantages to enterprises. The government has strong environmental incentives and controls. Enterprises choose green operation between seeking more government

subsidies and reducing penalties. Government environmental regulations can enhance entrepreneurs' willingness to be green entrepreneurial. Therefore, the government should attach great importance to the guiding function of environmental regulation on enterprises' sustainable development behavior, combine it with economic policy science, and give full play to the promoting role of green innovation. When the manufacturing enterprises face a high level of green market pressure, it will promote the enterprises to invest their core resources into green technology innovation and green market demand.

6. Conclusion and Limitations

First of all, the existing studies on GEO are mainly carried out from the aspects of concept definition, dimension division and the correlation with the enterprise performance.

The studies show that GEO has a significant promoting effect on enterprise performance and sustainable competitive advantage. However, the existing studies ignore the exploration of the causal conditions of green entrepreneurship orientation, and only a few studies are scattered. This study systematically reviews the driving factors of green entrepreneurship related to the existing literature, which can provide a reference for a comprehensive understanding of how enterprises balance internal and external environment to make green decisions. Secondly, existing studies focus on the outcome effect of GEO, and the discussion on its influencing factors is relatively scarce. Some studies only test the linear correlation between green entrepreneurship orientation and one or a few anthems. With 219 manufacturing enterprises as case samples, this study empirically analyzed three levels by using Spss24 and Amos24 analysis methods, and established a theoretical model of the influence mechanism of manufacturing enterprises' GEO. This paper aims to explore the causal complex mechanism affecting the formation of GEO in manufacturing enterprises, so as to make up for the shortcomings of current research. The results show that government compulsory regulation, government incentive regulation, market normative pressure, market imitative pressure, managers' environmental risk cognition and managers' environmental benefit cognition are important driving factors affecting manufacturing enterprises' green entrepreneurship orientation, and all have significant positive effects on manufacturing enterprises' GEO, which are necessary conditions leading to high GEO.

However, there are some limitations in this study. The influencing factors of enterprise GEO are complex and diversified. This study only discusses the formation mechanism and antecedent conditions of GEO from three aspects: government policy level, market demand level and organizational consciousness level. In the future, other influencing factors such as business ethics, economic uncertainty, enterprise scale and regional level can be further explored. While China's manufacturing industry provides a suitable background for relevant research on green entrepreneurship, other cultural and industrial backgrounds remain to be explored and can be further studied in the future.

Data Availability Statement

Data generated for the research is available on request.

References

[1] Cao, H.J., & Chen, Z.W. (2017). The driving effect of internal and external environment on corporate green innovation strategy: The moderating role of environmental awareness of executives, Nankai Management Review,20(06):95-10

[2] Chen, L.T., Zhu, Y.L., & Guo, L. (2018). Research on the Motivation of corporate green innovation response under multiple institutional pressures, Journal of Management,15(05):710-717. DOI: 10.3969/j.issn.1672-884x.2018.05.010

[3] Cui, X.M., & Yang, D.T. (2015). Relationship between ecological values, policy perception and green entrepreneurial intention. China Science and Technology Forum, 6 (6): 124-129. DOI: 10.13580/j.cnki.fstc.2015.06.023

[4] Dai, J., Cantor, D. E., & Montabon, F. L. (2015). How environmental management competitive pressure affects a focal firm's environmental innovation activities: a green supply chain perspective. Journal of Business Logistics, 36(3), 242–259. DOI：10.1111/jbl.12094

[5] Dean, T. J., & McMullen, J. S. (2007). Toward a theory of sustainable entrepreneurship: reducing environmental degradation through entrepreneurial action. Journal of Business Venturing, 22(1), 50–76. https://doi.org/10.1016/j.jbusvent.2005.09.003

[6] Deng, X.M., Liu, Y., Long, X.Y., Lin, X.Z., Yang, S.F., & Munkhbayar, K. (2021). Research on the relationship between environmental dynamics and organizational strategic change based on the cognitive perspective of managers. Nankai Management Review, 24(01):62-73.

[7] Elkington, J. (1997). Cannibals with Forks: The Triple Bottom Line of 21st Century Business. Capstone, Oxford.

[8] Eiadat, Y., Kelly, A., Roche, F., & Eyadat, H. (2007). Green and competitive? An empirical test of the mediating role of environmental innovation strategy. Journal of World Business, 43(2):131-145. https://doi.org/10.1016/j.jwb.2007.11.012

[9] Gast, J., Gundolf, K., & Cesinger, B. (2017). Doing business in a green way: a systematic review of the ecological sustainability entrepreneurship literature and future research directions. Journal of Cleaner Production, 147(3):44-56. DOI: 10.1016/j.jclepro.2017.01.065

[10] Gao, J.Y., & He, Y. (2011). A review of the research status of green entrepreneurship in foreign countries. Foreign Economics and Management, 33(2):10-16. DOI: 10.16538/j.cnki.fem.2011.02.003

[11] Habib, M.A., Yu, K.B., & Aboobucker, I. (2020). The impact of green entrepreneurial orientation, market orientation and green supply chain management practices on sustainable firm performance. Cogent Business & Management, 7(1):13-23. DOI: 10.1080/23311975.2020.1743616

[12] Hörisch, J., Kollat, J., & Brieger, S.A. (2017). What influences environmental entrepreneurship? A multilevel analysis of the determinants of entrepreneurs' environmental orientation. Small Business Economics, 48(1):47-69. DOI: 10.1007/s11187-016-9765-2

[13] He, S.C., Huang, X., & Chen, Q. (2017). Research on the relationship between entrepreneurial oriented and forward-looking environmental strategy and enterprise performance. Soft Science, 31(12): 25-28.DOI: 10.13956/j.ss.1001-8409.2017.12.06

[14] Huo, B., Li, S., & Zhao, X. (2018). Supply chain coordination and innovativeness: a social contagion and learning perspective. International Journal of Production Economics, 205(11), 47-61. DOI：10.1016/j.ijpe.2018.07.033

[15] Jeffrey, G.Y., & Venkataraman, S. (2009). The entrepreneur environment nexus: uncertainty, innovation, and allocation. Journal of Business Venturing, 25(5):449-463. DOI：10.1016/j.jbusvent.2009.07.007

[16] Jiang, W.B., Chai, H.Q., Shao, J., & Feng, T.W. (2018). Green entrepreneurial orientation for enhancing firm performance: a dynamic capability perspective. Journal of Cleaner Production, 198:1311-1323. 10.1016/j.jclepro.2018.07.104

[17] Lewis, G.J., & Harvey, B. (2010). Perceived environmental uncertainty: the extension of Miller's scale to the natural environment. Journal of Management Studies, 38(2): 201-234. DOI:10.1111/1467-6486.00234

[18] Li, H.J. (2015). Research on the relationship between institutional environment, green entrepreneurship orientation and performance. Social Sciences Bulletin, 3 (02):92-99.

[19] Li, H.J., & Chen, K. (2014). Research on the relationship between top management team, green entrepreneurship orientation and enterprise performance. Soft Science, 28(6): 90-94. DOI: 10.13956/j.ss.2014.06.025

[20] Li, Y.N., & Ye, F. (2011). The Relationship between institutional pressure, green innovation practice and enterprise performance: From the perspective of New Institutionalism theory and ecological modernization theory. Science of Science,29(12):1885-1894. DOI：10.16192/j.cnki.1003-2053.2011.12.018

[21] Li, Y.N., & Xu, L. (2017). Research on the relationship between competitive environment, green practice and firm performance. Science of Science and Management of Science and Technology, 38(02): 44-54.

[22] Ma, L., & Ma, M.S. (2018). The Relationship between business ethics, green entrepreneurial orientation and competitive advantage: A case study of new technology enterprises. Science and Technology Progress and Countermeasures, 35 (3): 80-86.

[23] Miller, D., & Friesen, P. H. (1983). Strategy-making and environment: The third link. Strategic Management, 4 (3): 221-235. DOI: 10.1002/smj.4250040304

[24] Nadkarni, S., & Barr, P. S. (2008). Environmental context, managerial cognition, and strategic action: an integrated view. Strategic Management Journal, 29(13):1395-1427. DOI：10.1002/smj.717

[25] Peng, X.R., & Wei, J. (2015). Stakeholder environmental orientation and enterprise ecological innovation: The moderating role of environmental awareness of top executives. Science of Science, 33(07):1110-1120. DOI: 10.16192/j.cnki.1003-2053.2015.07.018

[26] Sharma, S. (2000). Managerial interpretations and organizational context as predictors of corporate choice of environmental strategy. The Academy of Management Journal, 43(4), 681-697. DOI:10.2307/1556361

[27] Tang, Z., & Tang, J. (2012). Stakeholder-firm power difference, stakeholders' CSR orientation, and SMEs' environmental performance in China. Journal of Business Venturing, 27(4):436-455. DOI: 10.1016/j.jbusvent.2011.11.007

[28] Xia, H. (2019). The Relationship between Green entrepreneurship orientation, Active market orientation and innovation performance of technology start-ups. Science and Technology Management Research, 39(16): 264-274.

[29] Xu, J.Z., Guan, J., & Lin, Y. (2017). Institutional pressure, executive environmental awareness and corporate green innovation practice: from the perspective of new institutionalism and high-level theory, Management Review, 29(09):72-83.DOI：10.14120/j.cnki.cn11-5057/f.2017.09.007

[30] Zameer, H., Wang, Y., & Yasmeen, H. (2019). Reinforcing green competitive advantage through green production, creativity and green brand image: implications for cleaner production in China. Journal of Cleaner Production, 247(2), 119119. DOI：10.1016/j.jclepro.2019.119119

[31] Zhao, W., Feng, T., Xin, X., & Hao, G. (2020). How to respond to competitors' green success for improving performance: the moderating role of organizational ambidexterity. Business Strategy and the Environment, 30(1): 489-506.DOI: 10.1002/bse.2633

[32] Zhang, X.E., & Li, Q. (2021). Can Green entrepreneurial Orientation Form Green Competitive Advantage? Foreign Economics and Management, 43(5):20-33. DOI: 10.16538/j.cnki.fem.20200805.401

[33] Zhang, J.M., Liang, G.Q., Feng, T.W., Yuan, C.L., & Jiang, W.B. (2020). Green innovation to respond to environmental regulation: How external knowledge adoption and green absorptive capacity matter? Business strategy and the environment, 29(1):39-53. DOI: 10.1002/bse.2349.

[34] Zhu, Q., & Sarkis, J. (2007). The moderating effects of institutional pressures on emergent green supply chain practices and performance. International Journal of Production Research, 45(18-19), 4333-4355. DOI: 10.1080/00207540701440345