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A study of the relationship between learning orientation, innovation capability and firm performance

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Abstract:
Purpose: This study aims to investigate the relationship between learning orientation, innovation capability, and firm performance, filling a gap in existing research by considering innovation capability as a mediator and analyzing all three factors concurrently.
Design/methodology/approach: Based on a literature review, the relationship between learning orientation, innovation capability, and firm performance using structural equation modeling and data from Chinese tech-based SMEs was examined.
Findings: This paper identifies that learning orientation enhances knowledge accumulation and utilization, positively impacting business performance. Innovation capability directly improves business performance. It fully mediates between learning orientation and business performance. Companies valuing learning share their vision with employees, encouraging efforts and open-mindedness, significantly enhancing innovation. Learning orientation alone does not significantly impact performance; it requires mediation by innovation capability to achieve results at customer, employee, and financial levels.
Practical implications: The competitive environment As the competitive environment changes rapidly, enterprises need to adapt, grasp markets, and create new value. This study aims to uncover development patterns and solutions for tech enterprises, address issues, and enhance their economic strength.
Originality/value: This paper explores the impact of learning orientation on enterprise performance through the "strategy-competence-performance" framework, validates its practicality for tech enterprises, and highlights innovation capability's mediating role, filling a literature gap.

Keywords: Learning Orientation; Innovation Capability; Firm Performance.

Introduction

With the rapid development of science and technology, technology companies have become an important engine of global economic growth. 2024 World Top 500 Brands report released by GY Brand Global Brand Institute reveals that technology companies occupy six of the top ten seats (Apple, Microsoft, Google, HUAWEI, SAMSUNG, Tesla), with Apple accounting for 17.44%, Microsoft 16.50%, Google 15.09%, Huawei 6.28% and Samsung 5.28% of the total value of the technology industry.), with Apple accounting for 17.44% of the total value of the technology industry, Microsoft for 16.50%, Google for 15.09%, Huawei for 6.28% and Samsung for 5.51%, highlighting the strong innovation ability and corporate performance of technology companies. In addition, from the perspective of industry distribution, the technology industry has 49 brands selected, ranking second, with the total value and average value ranking first, its influence and competitiveness should not be underestimated. These technology companies are sweeping the world like a whirlwind, raising a series of questions about why technology companies are so innovative and perform so well.

In China, tech companies are also showing strong growth. According to China's Ministry of Science and Technology (2022), not only did the number of technology-based SMEs in China grow from less than 30,000 to 328,000 in 2017-2021, an average annual growth rate of 250 percent, but also the key innovation indicators and business data of the enterprises achieved significant growth. This phenomenon has triggered an in-depth discussion on the reasons for the rapid growth of the technology industry in China.

In the era of knowledge economy, the success of enterprises no longer relies solely on their traditional resource advantages and market shares, but more on their learning orientation and innovation capabilities. Learning, as one of the important factors for organizations to improve their performance, not only helps enterprises to accumulate and apply knowledge resources, but also is a prerequisite for technology-based enterprises to achieve good performance and sustained growth. Innovation capability, on the other hand, is the key to achieve product and service differentiation and helps enterprises to stand out in the fierce market competition.

Although scholars have conducted preliminary discussions on the relationship between learning orientation, innovation capability and enterprise performance, there are still some shortcomings in the existing studies. Firstly, most of the studies only focus on the impact of a single factor of learning orientation or innovation capability on firm performance, while ignoring the interaction and synergistic effect between the two. Secondly, there are still some limitations in the theoretical framework and empirical methods of existing studies, which make it difficult to comprehensively reveal the complex relationship between learning orientation, innovation capability and firm performance. Therefore, this paper aims to construct a more comprehensive and in-depth theoretical framework by integrating the existing literature and theories in order to explore the relationship between learning orientation, innovation capability and firm performance.

In conclusion, this paper aims to provide new ideas and methods for enterprises to cope with external changes and achieve sustainable development through the study of the relationship between learning orientation, innovation capability and enterprise performance. By deeply exploring the role and mechanism of learning orientation and innovation ability in enterprise performance improvement, this paper is expected to provide theoretical support and practical guidance for enterprises to make effective strategic planning and management decisions.

Theoretical Background

Organizational Learning Theory (OLT)

Under the wave of the knowledge economy, knowledge has become the core driving force in shaping the future, and the importance of organizational learning in enterprise development has become more and more significant. Since March and Simon defined organizational learning as an organized and hierarchical process of acquiring knowledge and improving competence in a complex and changing environment, with an emphasis on adaptation to the external environment, the field has been widely studied. Scholars such as Argyris (1977) have deepened their understanding of organizational learning and put forward the theories of single-loop learning, double-loop learning, and the four-stage model. Crossan et al. (1999) proposed the 4I framework for organizational learning, which provides a new perspective on the learning process, while March (1991) proposed explorative learning and exploiting learning. Dutta and Crossan (2005) applied the 4I framework of organizational learning to the study of entrepreneurial opportunities. Organizational learning not only spans cognitive, methodological, and behavioral dimensions but also integrates multiple disciplines such as economics, management, and organizational theory. Despite varying definitions, scholars generally agree that organizational learning is the key to supplementing, consolidating, and strengthening the knowledge base of an enterprise and is the cornerstone of its sustainable development. The construction of a learning organization is based on the cornerstone of individual employee learning and relies on knowledge sharing and exchange within the organization. Such an organization can better adapt to environmental changes, stimulate innovation, seize market opportunities, and create competitive advantages. The role of organizational learning is indispensable and crucial for the long-term survival and development of an organization. Yeung et al. (2007) proposed two perspectives of organizational learning: the organizational behavioral perspective and the strategic practice perspective, which emphasize the integration of individual and organizational learning cultures as well as the role of learning orientation at the organizational level, respectively. Porter (1990) further defined learning orientation as an organization's pursuit of continuous expansion of capabilities. defined as the process by which organizations pursue the continuous expansion of their capabilities, aiming to create the future through adaptive and creative learning. In 1990, Senge discussed the learning organization from the perspective of system dynamics and popularized the Five Disciplines model, which further enriches the theory of organizational learning. These five disciplines include: self-transcendence, which is the basis for personal spiritual growth; improving mental models, which requires an open attitude to discovering mistakes; establishing a common vision, which transforms personal ideals into the common mission and goals of the organization; group learning, which emphasizes the collective wisdom and strength to solve corporate problems; and systems thinking, which serves as the cornerstone for the construction of a learning organization. The combination of these five disciplines is key for organizations to achieve innovation and sustained growth. Ratten (2016) argues that learning-oriented organizations are more innovative. Learning orientation within organizations is crucial for businesses as it encourages members to continuously acquire, share, and apply new knowledge to adapt to changes in the environment and thus achieve competitive advantage. Garvin (1993), on the other hand, emphasizes the capabilities of learning organizations in knowledge acquisition, creation, and transformation. Therefore, continuous learning is essential in shaping an organizational learning culture that will continuously provide members with learning opportunities (Yang et al., 2004). These analyses provide this paper with a theoretical perspective for analyzing the learning orientation of start-ups and provide a theoretical basis and guidance for the mechanism of the impact of their learning orientation on innovation and firm performance.

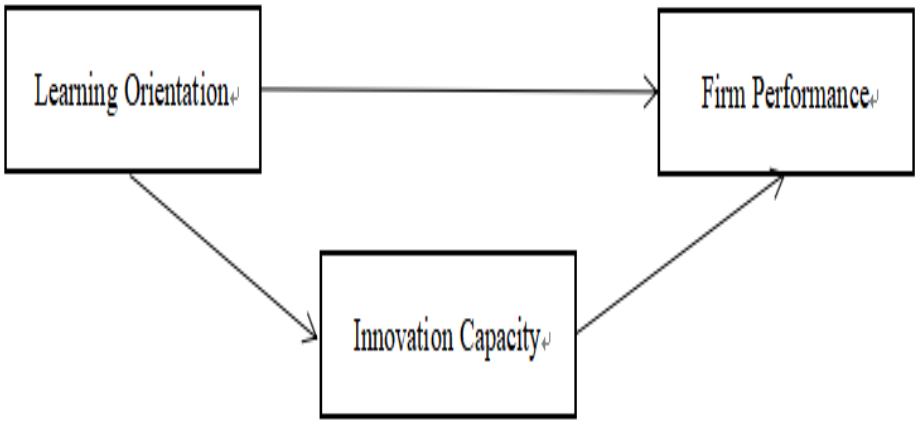

Figure 1: Research Framework

Hypothesis Development

(1) Relationship between learning orientation and innovation capability

Li Mengying et al. (2022) posited that firms dedicated to acquiring knowledge can greatly improve their ability to innovate by deeply understanding customer needs, mastering advanced technologies, and learning from both the successes and failures of their competitors. By fostering a culture of learning within the organization, a learning orientation not only facilitates knowledge creation but also plays a crucial role in the rapid growth of emerging firms (Honig B., Hopp C., 2019). De Clerq et al. (2014) argued that an organization's commitment to learning, along with the allocation of sufficient resources, determines its future growth and market acceptance by enhancing its learning capability. Hurley & Hult (1998) emphasized the importance of establishing a learning-oriented corporate culture, which in turn enhances an organization's innovation capability. Consequently, Chaveerug & Ussahawanitchakit (2008) asserted a significant and strong correlation between learning orientation and organizational innovativeness. Calantone, Cavusgil, and Zhao (2002) further supported the notion that organizational learning orientation plays a vital role in enhancing innovativeness. Hence, this study proposes:

H1: .Learning orientation demonstrates a significant positive correlation with innovation capability.

(2) Learning orientation and firm performance

Based on the findings of H1, it is evident that scholars widely acknowledge the significance of learning orientation in boosting innovation capability. Organizational knowledge integration relies on knowledge, with learning serving as the primary source of knowledge. Mallén (2016) and colleagues highlighted that organizational learning capability plays a pivotal role in influencing firm performance. Meanwhile, Yang Yanling et al. (2022) emphasized that learning orientation is essential for addressing resource scarcity and weaknesses in new ventures, facilitating external resource acquisition, internal knowledge sharing, and innovation capability by reinforcing learning commitment, establishing a shared vision, and fostering open-mindedness, thereby enhancing the firm's market competitiveness. Li Mengying et al. (2022) contended that learning orientation is critical for start-ups, enabling them to effectively leverage and enhance their existing knowledge while also facilitating the acquisition of new external knowledge and the rejuvenation of their knowledge base, ultimately bolstering

flexibility, rapid response capabilities, competitive advantage, and sustainable firm performance. Xincai Deng et al. (2021) conducted a study to examine the influence of learning orientation on the performance of new product development. New product development plays a vital role in organizational innovation activities, as it enables companies to adapt to market dynamics, increase market share, retain technical talent, and ensure the sustainability of innovation efforts. This, in turn, leads to a significant enhancement in the performance of new product development. In a study by Lee et al. (2014), it was argued that firms can achieve superior performance and innovation through knowledge learning and utilization. Aziz & Omar (2013) also investigated the impact of learning orientation on the performance of small and medium-sized enterprises (SMEs) and found that these learning orientations are associated with learning, innovation, and shared knowledge and vision. These factors, closely linked to learning orientation, have a positive influence on firm performance. Furthermore, Real et al. (2014) confirmed in their study that learning orientation significantly affects firms' performance in terms of sales revenue. Based on these findings, the present study proposes the following:

H2: Learning orientation exhibits a significant positive correlation with firm performance.

(3) Innovation capability and firm performance

The strong connection between innovation and firm performance has been widely acknowledged in academic circles. According to a study conducted by Jajja et al. (2017), the introduction of product innovation can significantly boost firm performance. Wang Xigang (2016) contended that organizational innovation can indirectly enhance firms' innovation performance by improving their technological innovation capabilities. The capacity to innovate is a crucial element in establishing high-performance firms (Cavusgil, Calantone, and Zhao, 2003). Innovation capability is viewed as the foundation of a firm's competitiveness (Neely & Hii, 1998; Denton, 1999; Jagle, 1999; Johannessen, Olaisen & Olsen, 1999) and the key to organizational profitability (Roberts, 1992). Hui Xu et al. (2014) suggested that the innovation capability of corporate performance must be enhanced. In light of the aforementioned points, this research puts forward:

H3: Innovation capability shows a significant positive correlation with firm performance.

(4) Mediating effect hypothesis derivation

The fact that learning orientation is strongly associated with the firm's capacity for innovation contributes to its notable effect on the performance of start-ups.According to Calantone et al. (2002), learning-oriented organizations can successfully increase their overall performance by boosting their innovation capabilities. They also highlight that learning orientation and innovation are predictors of company performance. A firm can only become established in a volatile market by showcasing its inventive spirit. Innovation is the cornerstone of a company's continuing survival and prosperity. The acquisition and use of knowledge is the foundation of all innovation, whether it takes the form of utilization-based innovation based on available resources or exploratory innovation seeking the frontier (Mahto R. V., Mcdowell W. C., Kudlats J.,2018). According to Drucker (1994), enterprises must continuously engage in innovation in order to survive in a highly competitive environment. This necessitates the development of an innovation culture within the organization. The formation of an innovation culture is facilitated by the organization's promotion of a learning orientation. In turn, this innovation culture guides both the organization and its employees to enhance their innovation capabilities (Hurley & Hult, 1998). Additionally, the organization's innovation activities are strengthened by the effects of organizational learning. Hence, innovation and organizational

learning are closely interconnected (Calantone et.al., 2002). Therefore, the following hypothesis is proposed in this study:
H4: Learning orientation will mediate the relationship between innovation capability and business performance.

Methods

(1)Sample Sampling

In order to determine the exact number of SMEs that are focused on research and technology in each economic growth zone, this study initially collected their basic data. To ensure the study's objectivity, the weighted average, which was proportional to the number of firms in each economic development zone, was then utilized to determine the number of questionnaires that should be distributed in each zone. After the questionnaires were distributed, various procedures, including pre-testing, were carried out to ensure the reliability and validity of the surveys.
To accomplish this, we utilized the random number table method. Each business in each economic development zone was assigned an Arabic number after the list of businesses was established. The numbering of the businesses was then done randomly, starting at any point in the table and continuing until the required number of questionnaires for the study were distributed. The sample size for the study was determined based on the research by Bagozzi & Yi (1998). According to their findings, a study should have a sample size of at least 100 in order to ensure its accuracy and reliability. Additionally, Hair et al. (1998) recommended setting the sample size at five times the number of items in the construct due to the broad nature of the study, as well as the time and human resources required.

(2)Questionnaire Method

This study's focus is on small and medium-sized enterprises (SMEs) that are founded in science and technology. Data on the fundamental state of these businesses are gathered by a questionnaire survey that is randomly sampled. The relevant research findings, which are broken down into five sections−learning orientation, innovation ability, enterprise performance, and basic information−as well as the research data from scholar Chung-Lin's (2010) thesis are combined with the questionnaire design. Innovation ability is used as the mediating variable in these sections. With the exception of the fundamental data, a 7-point Likert scale is used for measurement. Respondents mark the items with a '1' for strongly disagreeing and a '7' for strongly agreeing, based on the enterprise's current state and the explanation of each item. The organization of each question item is shown in Table 1.

Table 1 Summary of Initial Questionnaire Measures by Constructs

Uncertainties	Measuring Conformations	Subject	Reference
Learning Oriented（LO）	Learning Commitment（LC）	1-5	Santos-Vijande et al.(2005)
	Sharing the vision（SV）	6-10	
	open mindedness（OM）	11-15	
Organisational Cimate（OC）	Innovation Climate（IE）	16-23	Amabile（1996）
	Innovation restraint（IR）	24-30	

Innovation Capacity（IC）	technological innovation（TI）	31-39	Lin et al.(2004)、Bessant & Tidd（2007）
	Management Innovation（MI）	40-48	
Firm Performance（FP）	Customer Performance（CP）	84-87	Kirca, Jayachsndran and Bearden(2005)；Luo, Slotegraaf and Pan(2006)
	Financial performance（FP）	88-91	
	Employee Performance（EP）	92-95	
Basic information	Number of Persons, Years of Establishment Registered Capital Turnover Industry Type Management Position Donation Recipients	96-102	

Source: Tsai, Chung-Lin (2010), and collated in this study.

Structural Model Validation Analysis

This study employed a structural approach model analysis to validate the proposed constructs and examine the interplay between them, thereby enhancing the robustness of the findings. The analysis methodology utilized in this study was derived from the research methodology recommended by Anderson & Gerbing (1998). A two-stage approach was employed to conduct the model analysis and test the hypotheses put forth in this study through structural analysis.

During the process of constructing the model, the utmost importance lies in developing the research structure model. The measurement model should be established based on the original data to ascertain the relationships between variables and their interactions. This involves sorting, entering, and analyzing the data to verify the existence and significance of these relationships, ensuring a comprehensive understanding of the interrelationships between variables in the model.

(1) Model Analysis

Calculations were performed using AMOS 23.0.

(2) Model Fit Test

According to Table 2, it is evident that the CMICMIN/DF value is 2.121, which falls below the threshold of 3. Additionally, AGFI, GFI, NFI, TLI, IFI, and CFI all meet or exceed the standard of 0.9. The RMR value is 0.054, which is below the acceptable range of 0.08. Furthermore, the RMSEA value is 0.045, also below the threshold of 0.08. Overall, all the fitting indexes align with the general research standard, indicating that this model exhibits a good fit.

Table 2 Research model fit test results

Model fit indicators	OptimumValue	Statistical Value	Fit
CMIN	——	195.152	——
DF	——	92	——
CMIN/DF	<3	2.121	good
RMR	<0.08	0.054	good
GFI	>0.8	0.958	good
AGFI	>0.8	0.938	good

NFI	>0.9	0.935	good
IFI	>0.9	0.964	good
TLI	>0.9	0.953	good
CFI	>0.9	0.964	good
RMSEA	<0.08	0.045	good

The model fit of this research study satisfies the criteria of the indicators and falls within an acceptable range, thereby meeting the requirements for hypothesis testing. The direct relationship hypothesis is established through the path analysis presented in Table 3.

It is confirmed that the hypothesis stating that a learning orientation has a significantly positive impact on innovativeness (β =0.625, p<0.05) is valid. This implies that fostering a culture of learning within the organization, aligning the organization's vision with employees, and promoting an open-minded approach can enhance the organization's innovation capabilities both technologically and managerially. These results support the conclusions drawn by Calamtone et al. (2002), Liu et al. (2002), and Hult et al. (2002) regarding the crucial role of learning orientation in fostering innovation and the significance of innovation capability.

Learning orientation has been found to have no significant impact on business performance (β =0.091, p>0.05), rendering the hypothesis invalid. While commitment to learning, corporate vision, and open-mindedness are crucial for business success, it is important to note that learning orientation is just one factor in the development of high-performance businesses, not the sole determinant of success.

In contrast, innovation capability has a significant positive influence on business performance (β =0.308, p<0.05), confirming the validity of the hypothesis. The technological and managerial innovation capabilities of firms can lead to improvements in customer satisfaction, financial performance, and employee satisfaction. This aligns with the research of various scholars, such as Richey et al. (2005), Chaveerug & Ussahawanitchakit (2008), and others, who have also highlighted the positive impact of innovation capability on firm performance.

Table 3 Direct relationship hypothetical path coefficients

Method			Standar-dised Coefficient	Non-standar dised Coeffici ents	S.E.	C.R.	P	Hypothesis
innovation capacity	<---	learning orientation	0.625	0.609	0.068	8.932	***	Tenable
firm perform-ance	<---	learning orientation	0.091	0.088	0.073	1.206	0.228	Untenable
firm perform-ance	<---	innovation capacity	0.308	0.304	0.078	3.918	***	Tenable

(3) Hypothesis testing of mediating effect

In this study, Bootstrapping was used to test the mediating effect. It was shown that bootstrap confidence intervals not containing 0 correspond to the presence of indirect, direct, or total effects.

The Bootstrap method was run 5,000 times in AMOS 23.0 to derive the level values of Bias-Corrected versus Percentile at the 95% confidence level, as shown in Table 4 below.

Table 4 Total effects, indirect effects, direct effects

Method	Standardised Effect Value	Bias-Corrected 95%CI		Percentile 95%CI	
		Lower	Upper	Lower	Upper
	Total Effects				
Learning Orientation - Firm Performance	0.284	0.111	0.431	0.116	0.434
	Indirect Effects				
Learning Orientation - Innovation Capability - Firm Performance	0.193	0.017	0.585	0.011	0.565
	Direct Effects				
Learning Orientation - Firm Performance	0.091	-0.335	0.394	-0.343	0.388

The learning orientation's overall impact on business performance, as shown in the above table, is 0.284. This value does not fall between 0 and the Lower and Upper values of Bias-Corrected and Percentile95% CI. This suggests that a complete effect is present. The study reveals that learning orientation has an indirect effect on business performance through innovation capability. This effect has a value of 0.193, and it is not zero in the Lower and Upper value intervals of Bias-Corrected and Percentile95% CI. These findings suggest the existence of an indirect effect. The value of the direct effect of learning orientation on company performance in the direct effect medium test is 0.091, which does contain 0 within the value interval of both Lower and Upper of Bias-Corrected and Percentile95% CI, indicating that the direct effect does not exist.

The hypothesis that innovativeness re-learning orientation has a fully mediating role in the impact of business performance of enterprises is valid, it can be determined from the analysis above. This suggests that learning orientation has a major impact on innovation capability, which in turn has a major impact on business performance. It also shows that there is a significant relationship between learning orientation and both innovation capability and business performance.

Discussion and Conclusion

Innovation, as the core driving force of an enterprise, is crucial to enhancing its competitiveness in a fierce business environment. How to effectively promote innovation and improve competitiveness is a topic that every enterprise needs to think deeply about and put into practice, and it is also a hot topic that has been long explored by academics. Based on the theory of input-processing-output, this study constructs a theoretical model between learning orientation, innovation capability capability, and business performance, aiming to deeply analyze the interactions between these variables and provide new perspectives for solving the problems of management theory and practice. Unlike previous studies that mostly focus on financial performance or the balanced scorecard, this study explores the intrinsic connection between learning orientation and business performance by taking innovation ability as the core mediating variable based on the in-depth analysis of the characteristics of science and technology-based enterprises. The empirical results show that innovation capability plays a complete mediating role between learning orientation and firm performance, which highlights

the importance of "learning by applying", applying," i.e., firms not only need to actively learn, learn but also need to effectively transform what they have learned into innovation capability, so as in order to enhance the overall performance and competitiveness of the firms. Through this study, we can easily find that although learning orientation provides enterprises with abundant knowledge and information, learning alone is not enough. Enterprises need to transform learning results into actual innovation capabilities, and through innovation to innovation, promote the upgrading of products and services to meet market demand, and ultimately enhance the performance level of the enterprise. At the same time, this process also promotes the formation and development of enterprise culture, which further enhances the cohesion and competitiveness of enterprises.

Theoretical Implications

(1)This study will identify the variables related to learning orientation, innovation capability, and corporate performance by focusing on corporate innovation activities. It will also involve extensive literature collection and discussion to find out the relationship between these variables. This will lay the foundation for the in-depth study of this thesis and provide original insights through theoretical comparisons.

(2) Learning is considered one of the most important factors for organizations to improve their performance. This study aims to investigate whether a learning-oriented corporate culture can better promote the transformation of corporate performance. If so, it will explore how to construct a learning path to facilitate this transformation. Through the summary and induction of this study, a specific implementation path for corporate learning orientation will be proposed to ensure the improvement of corporate performance.

Practical and Social Implications

(1) Since the competitive environment of the industry has changed dramatically with social changes and technological advances, it is a matter of great urgency for firms to adapt to these changes, effectively and quickly grasp the market and inject new values, including innovation and change, and it is of practical significance to solve these problems.

(2) It is hoped that through this study, the laws and paths of firmdevelopment will be discovered, the problems existing in firms will be solved, and suggestions will be provided for the development of firms as well as the enhancement of their economic strength, and at the same time, the results of this study will be used to provide suggestions for firms to further enhance their competitive advantages and help other industries to develop, which is also the practical significance of the study.

Limitations and Suggestions for Future Research

(1) Research Object Expansion: Future research can further expand this study to more diversified industry sectors, such as e-commerce, small commodity manufacturing, etc., in order to explore the relationship between learning orientation, innovation capability,and firm performance in different industry contexts. Meanwhile, it can also focus on the differences between listed and unlisted firms, as well as the impact of factors such as geography and industry on the research results.

(2) Theoretical framework enrichment: Subsequent studies can incorporate more concepts or mediating variables, such as digital orientation, entrepreneurial orientation, knowledge sharing, human capital, etc., to enrich and improve the theoretical framework. The inclusion of these variables helps to understand the influencing factors of business performance more comprehensively and improve the accuracy of predicting regional economic development.

(3) Performance indicator innovation: For enterprises of different industries and scales, more precise and targeted performance indicators should be used to measure their business results. Follow-up research can design corresponding enterprise performance indicators for different industrial scales and other characteristics to more accurately reflect the actual operating conditions and development potential of enterprises.

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