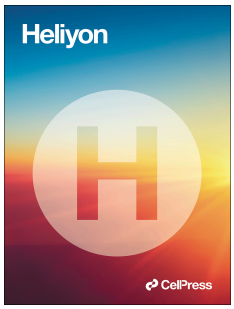

Entrepreneurial bricolage and entrepreneurial performance: The role of business model innovation and market orientation

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Entrepreneurial Bricolage and Entrepreneurial Performance: The Role of Business Model Innovation and Market Orientation[1]

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ABSTRACT

Newly established enterprises in China face significant challenges and opportunities, with persistently high mortality rates. Navigating market challenges and establishing sustainable competitive advantages are pressing issues for contemporary businesses. This study delves into the bridging role of business model innovation between entrepreneurial bricolage and entrepreneurial performance, with market orientation influencing the relationship boundaries. We examined 288 Chinese small and medium-sized enterprises, investigating the relationships among entrepreneurial bricolage, business model innovation, market orientation, and entrepreneurial performance. Empirical results indicate: (1) Entrepreneurial bricolage positively influences business model innovation, and business model innovation positively impacts entrepreneurial performance. (2) Business model innovation plays a fully mediating positive role between entrepreneurial bricolage and entrepreneurial performance. (3) Market orientation positively moderates the impact of entrepreneurial bricolage on business model innovation and entrepreneurial performance, and it also positively moderates the impact of business model innovation on entrepreneurial performance. (4) Market orientation positively moderates the impact of entrepreneurial bricolage, mediated by business model innovation, on entrepreneurial performance. The study results contribute to a more effective understanding of the mechanisms through which entrepreneurial bricolage and business model innovation influence entrepreneurial performance, as well as how market orientation moderates their relationships and how enterprises sustain competitive advantages.

1.Introduction

In recent years, entrepreneurship has become a new focal point for economic and social development worldwide, seen as a new driving force for promoting economic and social progress. In today's highly competitive business environment, new startups face significant challenges and opportunities. While there have been many successful new startups that have achieved brilliance through business model innovation, such as Didi, Xiaomi, and Xiami Music, the mortality rate of new startups remains high. For instance, in the bike-sharing industry, apart from the leading companies Mobike and Ofo, almost all second and third-tier companies' financing processes have been concentrated around Series A or A+ rounds, with many experiencing a wave of closures since the second half of 2017. In the complex and rapidly changing environment, due to inherent "new" and "small" disadvantages, new startups generally have a higher failure rate [1]. Therefore, how new startups can address market challenges and build sustainable competitive advantages is a pressing issue for enterprises today and will continue to be a research hotspot in the field of strategic management for a long time.

Entrepreneurship can undoubtedly contribute significant value to the economy and society [2]. For new startups, enhancing entrepreneurial performance becomes a practical challenge. Read points out that the success of most startups often stems from initially

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overlooked idle resources [3]. Entrepreneurial bricolage is a way of rationalizing the allocation of these idle (or redundant) resources, allowing startups to obtain enterprise value at the lowest cost, thereby contributing to performance improvement [4]. Entrepreneurial bricolage also facilitates entrepreneurs in innovating and adjusting business models [5]. Therefore, entrepreneurial bricolage, as a precursor to business model innovation, can provide new business opportunities and innovative ideas for enterprises [6]. However, startups are constantly in a predicament of resource constraints, and to build novel business models, they have no choice but to creatively combine existing resources[7]. Business model innovation also has a positive impact on entrepreneurial performance [8]. It is an essential means for enterprises to achieve performance, but this innovation process continually evolves in overcoming market uncertainty [9]. Thus, enterprises must be market-oriented, continuously adjusting and optimizing their products, services, and market strategies [10]. Market orientation is a culture that emphasizes creating excellent value for customers, creating more value for customers through shared value concepts, behavioral norms, and effective process combinations, thereby achieving outstanding organizational performance [11]. In the early stages of entrepreneurship, startups face the problem of resource constraints. A market-oriented strategy that focuses on customer needs and actively captures market opportunities is an effective way to gain competitive advantages for enterprises [12]. Research indicates that market orientation can enhance entrepreneurs' sensitivity to market demand, thus promoting entrepreneurial bricolage and business model innovation [5,8], ultimately boosting entrepreneurial performance.

Although research on the relationship between entrepreneurial bricolage and the performance of new startups has gradually received attention in recent years, there are still several limitations. First, since entrepreneurial bricolage and entrepreneurial performance theories are relatively new in the field of entrepreneurship research, empirical studies are limited. Most current research only explores the direct relationship between the two, and there is a lack of research on the intermediate paths through which entrepreneurial bricolage affects the performance of new startups [13]. The relationship between entrepreneurial bricolage and the performance of new startups is still in a "black box," requiring in-depth research into the underlying mechanisms. Second, creative bricolage of available resources is highlighted as facilitating business model innovation [14], and business model innovation is a crucial foundation for the formation and enhancement of startup performance. Unfortunately, there is limited research on this aspect. Third, the formation of the performance of new startups is influenced by various factors, especially the complex and variable market factors that startups face. Market orientation is a crucial contingency variable in the process of forming startup performance. Therefore, investigating the role of market orientation in the mechanism through which entrepreneurial bricolage affects the performance of new startups is essential. However, existing literature on the role of market orientation in this mechanism is scarce. Therefore, analyzing the contingency factors in the mechanism of how entrepreneurial bricolage affects the entrepreneurial performance of new startups is necessary.

Additionally, some scholars believe that studying how new startups can enhance entrepreneurial performance from the perspective of dynamic capabilities is a new and innovative approach [15]. Building upon the achievements of previous scholars, this study, based on dynamic capabilities theory, focuses on exploring the mechanism and effects of how entrepreneurial bricolage influences entrepreneurial performance. It incorporates business model innovation and market orientation into the research framework, investigates the bridging role of business model innovation between entrepreneurial bricolage and entrepreneurial performance, and explores the boundary effects of market orientation on the relationship between entrepreneurial bricolage and entrepreneurial performance. Based on these research elements, this study breaks down into three sub-problems for clearer elucidation: (1) How does entrepreneurial bricolage affect the entrepreneurial performance of new startups? What are the pathways of its effects? In response to the increasingly complex and dynamic market, many new startups have either started or are preparing to engage in resource bricolage activities. However, the experiences of individual companies are insufficient to cover the entire industry, and some startups still adopt a wait-and-see attitude towards entrepreneurial bricolage. Therefore, the first sub-problem of this study is to explore the impact and pathways of entrepreneurial bricolage on entrepreneurial performance, providing theoretical guidance for the significance of entrepreneurial bricolage and offering insights for startups engaging in entrepreneurial bricolage. (2) During the process of entrepreneurial bricolage, what role does business model innovation play for new startups? In previous studies, scholars have investigated the relationship between business model innovation and entrepreneurial performance through empirical methods, but their conclusions vary. This suggests that the relationship between business model innovation and entrepreneurial performance is extremely complex. Therefore, the second sub-problem of this study, from the perspective of dynamic capabilities, is to examine the role of business model innovation in the relationship between entrepreneurial bricolage and entrepreneurial

performance. (3) How does market orientation regulate the relationship between entrepreneurial bricolage, business model innovation, and entrepreneurial performance for new startups? With today's intensifying market competition and significant uncertainties brought about by global economic slowdowns and geopolitical conflicts, accurately understanding market orientation is crucial for the development of new startups. However, there is limited literature that introduces market orientation as a variable in the study of entrepreneurial bricolage, business model innovation, and entrepreneurial performance. Therefore, the third sub-problem of this study is to treat market orientation as a moderating variable, exploring its regulatory role in the relationship between entrepreneurial bricolage, business model innovation, and entrepreneurial performance, revealing the boundary conditions of entrepreneurial bricolage on business model innovation and entrepreneurial performance.

In comparison with existing research, this paper contributes in several ways: Firstly, although there have been numerous discussions on entrepreneurial performance, previous studies often individually consider the impact of either entrepreneurial bricolage or business model innovation on entrepreneurial performance. There is limited research that comprehensively investigates these variables together. This study provides theoretical insights into the existing field of entrepreneurship research. Secondly, scholars exploring the relationship between entrepreneurial bricolage and entrepreneurial performance have introduced various mediating variables, such as organizational learning, self-efficacy, and knowledge search. However, few studies have included business model innovation as a crucial variable in their research models, particularly among Chinese scholars who have not paid attention to this aspect. This study enriches the literature on the relationship between entrepreneurial bricolage and entrepreneurial performance. Thirdly, scholars have examined the boundary conditions of how entrepreneurial bricolage influences business model innovation and entrepreneurial performance, considering external environmental dynamics and other external factors that companies cannot change. However, they have overlooked the important influence of market orientation. This paper analyzes, from a micro perspective, the specific impact of market orientation on how entrepreneurial bricolage influences business model innovation and entrepreneurial performance, supplementing academic research on the relationship between entrepreneurial bricolage and business model innovation, as well as entrepreneurial performance.

2.Research Hypotheses

2.1 Entrepreneurial Bricolage and Entrepreneurial Performance

In the process of growth and development, entrepreneurial ventures often face resource constraints. Overcoming resource scarcity is crucial for the survival and development of new ventures. Baker and Nelson propose that entrepreneurs can integrate stakeholders through entrepreneurial bricolage to expand their networks and access more available resources, thereby enabling timely exploration of entrepreneurial opportunities and enhancing the chances of survival and development [16]. Salunke found through empirical research that entrepreneurial bricolage helps entrepreneurial ventures gain sustained competitive advantage in the market and improve their performance [17]. Zhu et al. discovered that the differential competitive advantage among entrepreneurial ventures lies not only in resource differences but also in different development approaches for the same resources. Entrepreneurial bricolage significantly enhances the performance of new ventures [18]. Yi Zhaohui et al. discussed the mechanism of entrepreneurial bricolage affecting the entrepreneurial performance of small and micro technology-based enterprises from the perspective of previous experience [19]. Through an empirical analysis of the survey data of 317 small and micro technology-based enterprises, they concluded that entrepreneurial bricolage is positively correlated with the entrepreneurial performance of small and micro technology-based enterprises. Yan Huafei (2019) took 326 entrepreneurs as samples, adopted multi-layer regression analysis method, and found through empirical research that entrepreneurial bricolage has a positive impact on the growth performance of new enterprises [20]. Tong Xin et al. used the survey data of 325 family farms in Hunan Province to explore the impact mechanism of entrepreneurial piecing on the entrepreneurial performance of family farms [21]. It is found that entrepreneurial bricolage has a significant positive effect on entrepreneurial performance of family farms. Wang Zhong et al. found that peasant entrepreneurs can improve entrepreneurial performance by piecing together and reorganizing existing resources at hand [22]. By breaking through the fixed value of existing resources, adopting unconventional approaches, and constantly innovating, entrepreneurial bricolage reduces the risk of venture failure and provides more possibilities for firm development. Based on these findings, the following hypothesis is proposed:

H1: Entrepreneurial bricolage is positively associated with entrepreneurial performance.

2.2 Entrepreneurial Bricolage and Business Model Innovation

Entrepreneurial bricolage is an emerging strategic approach for firms to integrate and repurpose internal and external resources, aiming to overcome resource constraints in a more flexible and effective manner. By creatively combining available resources and establishing more efficient or novel ways of resource integration, entrepreneurial bricolage can lead to changes or innovations in business models [23]. Emphasizing fleeting business opportunities and engaging in selective and disruptive resource development activities through bricolage strategies can provide irreplaceable business resources for business model innovation. Furthermore, entrepreneurial bricolage inherently involves process innovation in resource utilization, often driving significant innovation in operational processes and business models [24]. To implement entrepreneurial bricolage effectively, firms need to tap into all available internal resources and optimize their integration. Moreover, the process of entrepreneurial bricolage often requires organizational improvisation and the ability to practice thinking, demonstrating organizational agility and absorptive capacity [25]. Xu Shangde conducted empirical analysis to explore the interactive relationship between value chain constraints, entrepreneurial bricolage, and business model innovation in new rural online retail enterprises [26]. The findings revealed that entrepreneurial bricolage has a significantly positive impact on business model innovation in new rural online retail enterprises. Wang Xin based on entrepreneurial bricolage theory and innovation theory, took entrepreneurial bricolage as a starting point and conducted research around the fundamental question of "how companies promote business model innovation through entrepreneurial bricolage"[27]. Through empirical research, it was found that resource bricolage, customer bricolage, and institutional bricolage all show a positive correlation with business model innovation. In summary, entrepreneurial bricolage is not just a specific way of resource utilization but a new management logic for resource utilization that emphasizes recombining resources to reshape operational processes and business models. Based on these perspectives, the following hypothesis is proposed:

H2: Entrepreneurial bricolage is positively associated with business model innovation.

2.3 Business Model Innovation and Entrepreneurial Performance

The process of business model innovation for firms is a significant "disruptive innovation" process that aims to transform existing business operating models to create more value and gain competitive advantage [28]. Therefore, business model innovation can promote strategic transformation and change within firms and is an important factor in improving firm performance [29]. Zott and Amit (2007) collected data from 190 listed entrepreneurial firms in Europe and the United States [30]. The results showed that novel center-based business model design had a significant positive impact on entrepreneurial firm performance. Studies conducted by Wang et al., Wen et al., and others have examined the relationship between business model innovation and firm performance, suggesting that business model innovation is an important source of competitive advantage and performance for firms [31-32]. Constantinides et al. argued that digital business model innovation changes the way value is obtained and created, allowing firms to expand their value space and achieve exceptional performance by flexibly adapting to environmental changes [33]. The rapid development of digital technology provides infinite possibilities for business model innovation, intensifying competition among firms as they seek to create new value in this "blue ocean" market. Luo et al. examined 512 Chinese entrepreneurial firms and confirmed a positive correlation between business model innovation and firm performance [34]. Chi Kaoxun et al. constructed a model for the impact mechanism of business model innovation on the performance of new startups based on resource management theory [35]. Through empirical analysis of questionnaire data from 142 new startup companies, they found that business model innovation contributes to improving the performance of new startups. Tong Ziqiang et al. used growth-stage listed companies on the Shanghai and Shenzhen stock exchanges from 2014 to 2019 as their sample [36]. They employed text analysis techniques using Word2Vec to measure the level of business model innovation in these companies based on annual financial data. Their empirical research revealed a significant positive impact of business model innovation on the performance of latecomer companies.

Based on these perspectives, the following hypothesis is proposed:

H3: Business model innovation is positively associated with entrepreneurial firm performance.

2.4 The Moderating Role of Market Orientation in the Relationship between Entrepreneurial bricolage and Business Model Innovation

Market orientation is an important strategic orientation, and firms with a high level of market orientation can achieve excellent innovation performance, including rapid development of new products or services and improvements or innovations in existing business models[37]. This is because firms with a market orientation have higher dynamic capabilities in resource allocation and coordination. Business model innovation, as a proactive market-oriented innovation, benefits from the implementation of market-oriented strategies and

outperforms competitors in new market development, new customer acquisition, and new transactions [34]. Based on a survey of 434 Chinese firms, Yuan et al. found that market orientation positively moderates the relationship between entrepreneurial bricolage and innovation type [38].Tong Qi based on research data from 261 companies in the Yangtze River Delta region, found that companies emphasizing big data capabilities experience a positive moderating effect on the relationship between entrepreneurial bricolage and business model innovation [39]. It can be said that market-oriented firms actively promote the development of entrepreneurial bricolage to extract the necessary resources from the market, combine them with existing resources, and make informed decisions to grasp the direction of business model transformation or enhancement. Similarly, under market orientation, the knowledge or new insights generated by entrepreneurial bricolage are more aligned with market needs, reducing the failure rate of business model innovation by striving for alignment with the external environment. The alignment between the two creates great potential for the innovation and evolution of business models. Based on these arguments, the following hypothesis is proposed:

H4: The role of entrepreneurial bricolage in business model invitation is moderated by market orientation.

2.5 The Moderating Role of Market Orientation in the Relationship between Entrepreneurial bricolage and Entrepreneurial Performance

Entrepreneurial bricolage is a process of creating value "out of nothing" for firms [16]. Through entrepreneurial bricolage, new ventures can use the rational allocation of existing resources to change the mismatched state of resources, break established development patterns, and gain a competitive advantage, thereby promoting performance improvement and sustained development [40]. Therefore, when facing similar resource environments, entrepreneurial bricolage can stimulate the generation of heterogeneous value, leading to performance improvement [41]. Market orientation, on the other hand, is also a proactive adaptive learning process, and firms with a higher level of market orientation can continuously update, design, and improve products, services, and processes based on their keen understanding of market changes [42]. To some extent, the level of market orientation determines a firm's ability to obtain valuable market information [43], which helps firms take action by breaking conventions, finding innovative solutions, and combining hypotheses with innovation through bricolage, generating previously unrealizable problem-solving approaches [17]. Therefore, the combination of market orientation and entrepreneurial bricolage is also an important strategic choice for enhancing entrepreneurial performance. Based on these arguments, the following hypothesis is proposed:

H5: The role of entrepreneurial bricolage in entrepreneurial performance is moderated by market orientation.

2.6 The moderating effect of market orientation on the relationship between business model innovation and entrepreneurial performance.

Entrepreneurial ventures face constantly changing markets, which means that their existing business models may not provide sustained competitive advantages. Therefore, it is necessary to transform and innovate business models in response to market changes [44]. The higher the degree of market orientation, the more likely an enterprise is to engage in innovation. Market fluctuations bring new market opportunities for entrepreneurial ventures, allowing them to construct new models for creating business value based on market conditions. Business model innovation is a crucial driving factor in the formation of competitive advantages and performance improvement for enterprises, and in this driving process, the uncertain market plays a significant role. Research suggests that market orientation demands enterprises to generate more new ideas and new thoughts, enabling them to undertake change and innovation in turbulent markets [45].When market orientation is high, market requirements for business model innovation by new ventures also increase, allowing the role of business model innovation to be better realized. Thus, the alignment and interaction between market orientation and business model innovation may act as catalysts for entrepreneurial performance. Different levels of market orientation can positively influence the relationship between business model innovation and entrepreneurial performance. Based on this, the following hypothesis is proposed:

H6: The role of business model invitation in entrepreneurial performance is moderated by market orientation.

2.7 *The mediating role of business model innovation in the relationship between entrepreneurial bricolage and entrepreneurial performance.*

Bricolage activities often lead to unpredictable innovative outcomes [46]. This is because entrepreneurial bricolage itself is an innovative behavior that combines means and ends [47]. For entrepreneurial ventures, any form of business model innovation can enhance their performance [30]. Therefore, business model innovation is one of the key paths for the formation and improvement of performance for new ventures [48]. At the same time, entrepreneurial bricolage is one of the important antecedents of business model innovation [49]. Entrepreneurial bricolage provides convenience for business model innovation by recombining and reusing fragmented resources related to new opportunities [16]. Duan Haixia et al. based on the perspective of enterprise resources, used three typical family farms in Hunan

Province as case studies to explore the relationship between entrepreneurial bricolage, business model innovation, and the entrepreneurial performance of family farms [50]. The research found that in resource-constrained situations, family farms adopt differentiated entrepreneurial bricolage strategies and enhance entrepreneurial performance by innovating different elements of their business models to achieve sustainable development. Li Xinyi conducted a study by surveying entrepreneurial enterprises using various entrepreneurship platforms such as entrepreneurial incubators, coworking spaces, and LinkedIn [51]. The research revealed that business model innovation plays a partial mediating role in the impact of entrepreneurial bricolage on entrepreneurial performance. As seen from the previous analysis, there is a causal logic relationship between entrepreneurial bricolage, business model innovation, and entrepreneurial performance. On one hand, entrepreneurial bricolage provides convenience and possibilities for enterprise business model innovation. On the other hand, business model innovation helps enterprises shape new competitive advantages, which are powerful guarantees for performance improvement. Therefore, the impact of entrepreneurial bricolage on entrepreneurial performance can be realized through the mediating effect (i.e., business model innovation). Based on this, the following hypothesis is proposed:

H7: Business model innovation indirectly influences the relationship between entrepreneurial bricolage and entrepreneurial performance.

2.8 The moderating effect of market orientation on the relationship between entrepreneurial bricolage, mediated by business model innovation, and entrepreneurial performance.

Business model innovation enables enterprises to overcome developmental challenges, explore customer needs, and enhance enterprise value [52]. Entrepreneurial bricolage helps new ventures develop new content, structures, governance processes, and capture new opportunities [16], thus effectively driving the implementation of business model innovation for new ventures [49]. From this perspective, entrepreneurial bricolage provides convenience and possibilities for enterprise business model innovation, while business model innovation lays the foundation for improving entrepreneurial performance. Therefore, this study proposes the hypothesis of the mediating role of business model innovation between entrepreneurial bricolage and new venture performance. Additionally, the more pronounced the market orientation, the more likely the enterprise is to engage in disruptive innovation activities, and the more likely the role of business model innovation will be realized. Thus, this study proposes the hypothesis of the moderating effect of market orientation on the relationship between business model innovation, entrepreneurial bricolage, and new venture performance. When market orientation levels differ, the impact of business model innovation on new venture performance will vary. Based on this, this study further suggests that the path in which entrepreneurial bricolage influences entrepreneurial performance through business model innovation will also be moderated by market orientation. When market orientation is high, on the one hand, entrepreneurial bricolage activities promote new ventures to implement business model innovation; on the other hand, a higher level of market orientation can stimulate the role of business model innovation in new ventures, leading to a greater improvement in entrepreneurial performance. However, when market orientation is low, even if entrepreneurial bricolage activities promote the implementation of business model innovation in new ventures, the limited market orientation may prevent the effects of business model innovation from being highlighted, resulting in limited improvements in entrepreneurial performance. In other words, market orientation has a positive influence on the "entrepreneurial bricolage - business model innovation - entrepreneurial performance" path. Based on this, the following hypothesis is proposed:

H8:Market orientation moderates the impact of entrepreneurial bricolage on entrepreneurial performance through business model innovation.

3.Methodology

3.1 Sample Source

This study focuses on entrepreneurial enterprises established within 8 years, using alumni associations from various universities in Hubei Province to assist in the research. Due to the comprehensive nature of the survey, founders who possess knowledge about the company's situation were chosen as respondents. A simple random sampling method commonly employed in entrepreneurial research was used, with questionnaire-based interviews conducted face-to-face. Researchers interviewed each founder, and the survey duration for each company was approximately 20-30 minutes.

The survey consisted of two phases: In the first phase, executives completed individual questionnaires independently. In the second phase, researchers conducted interviews with the founders to validate the questionnaire's authenticity. Before distributing the questionnaires, the purpose and content of the study were thoroughly explained to ensure that the provided information would only be used for academic

research.

The survey was conducted between September 2022 and February 2023. A total of 338 questionnaires were distributed. After removing incomplete or patterned responses, 288 valid questionnaires were obtained, resulting in an effective response rate of 85.21%. Among them, 94 companies were less than 3 years old, 92 companies were 3-5 years old, and 102 companies were 5-8 years old. There were 67 companies with fewer than 50 employees, 81 companies with 50-100 employees, 92 companies with 100-200 employees, and 48 companies with over 200 employees. In terms of registered capital, 102 companies had capital less than 10 million RMB, 101 companies had capital between 10 million and 20 million RMB, and 85 companies had capital exceeding 20 million RMB. In terms of industry distribution, 87 companies were in the agricultural sector, 104 companies were in the industrial sector, and 97 companies were in the service sector.

3.2 Variable Measurement and Research Model

The measurement of market orientation (MO) is based on a scale developed by Narver et al. [53], consisting of 8 items; the measurement of business model innovation (BI) follows a scale developed by Hunt et al. and revises it according to the research results of Dubey [54,55], consisting of 6 items; the measurement of entrepreneurial bricolage (EP) adopts a scale developed by SENYARD et al. [56], consisting of 8 items; and the measurement of entrepreneurial performance (EP) refers to a scale developed by Chandler and Hanks [57], with modifications made to the specific items to fit the needs of this study, consisting of 8 items. A 5-point Likert scale is used to measure the above variables, with a range from "strongly disagree" to "strongly agree", corresponding to the numbers "1" to "5", as shown in Table 1.

Table 1. Measurement Variables and Items

Market Orientation	The primary goal of the company's production is customer satisfaction.
	The company formulates competitive strategies based on customer needs.
	The company frequently tests customer satisfaction.
	The company is more concerned about customers than its competitors.
	The company constantly strives to discover needs that customers are not aware of.
	The company seeks opportunities in areas where customers have difficulty expressing their needs.
	The company puts a great deal of effort into figuring out how customers consume its products.
	The company predicts mainstream trends in order to discover customers' future needs.
Business Model Innovation	Our business model provides value-added products and services.
	Our business model creates new profit models.
	Our business model creates new profit centers.
	Our business model adopts innovative transaction methods.
	Our business model constantly introduces new operational processes, routines, and norms, leading to reduced costs.
	Overall, our business model is novel and innovative.
Entrepreneurial Bricolage	When facing new challenges, we are confident to find feasible solutions using our existing resources.
	Compared to other companies, we can use our existing resources to handle more challenges.
	We make the most of any existing resources to deal with new problems or opportunities in entrepreneurship.
	By integrating our existing resources and low-cost resources to deal with new challenges.
	When facing new problems or opportunities, we assume that we can find feasible solutions and take action.
	By integrating our existing resources, we can successfully handle any new challenges.
	When facing new challenges, we combine our existing resources to create feasible solutions.

	We successfully cope with new challenges by integrating resources that were not originally intended for the plan.
Entrepreneurial Performance	The company maintains a high profit margin.
	The company's net asset return rate is at a leading level (return on investment).
	Company's number of employee is growing rapidly.
	New products or services are developed quickly by the company.
	The company's sales revenue is growing rapidly.
	The company's product market share is growing rapidly.
	The company's net earnings are growing rapidly.
	Starting this business makes me feel satisfied.

Building upon the discussions presented in the aforementioned literature, this study analyzes the relationship between entrepreneurial bricolage and entrepreneurial performance. Furthermore, it delves into the mediating role of business model innovation between entrepreneurial effort and entrepreneurial performance. The study also investigates the moderating effect of market orientation in this relationship. A moderated mediation model was established (Figure 1) based on these concepts.

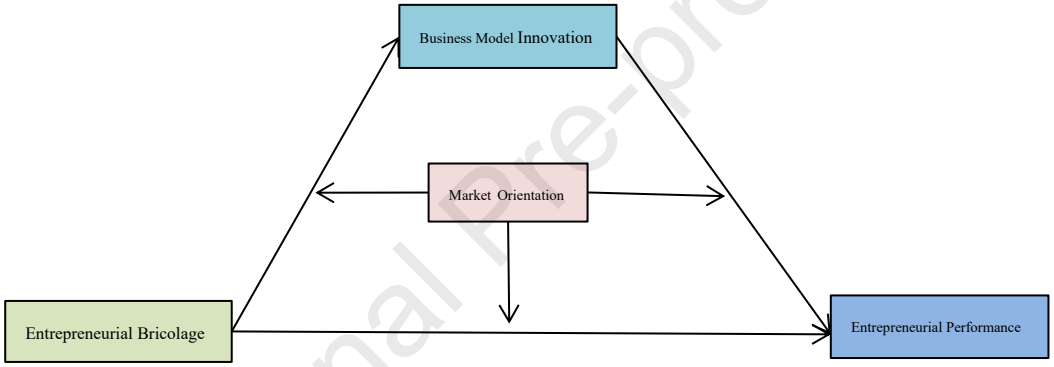

Figure 1. Theoretical Model

4.Results

4.1 Construct Validity and Common Method Bias Test

Table 2 presents the results of the confirmatory factor analysis. The factor loadings for each item range between 0.804 and 0.923, indicating strong factor loadings. The composite reliability (CR) values for all items exceed 0.9, demonstrating high internal consistency of the measurement scale. The average variance extracted (AVE) values for all constructs are above 0.6, indicating good convergent validity among variables. The square roots of the AVE values are greater than the Pearson correlation coefficients between constructs, indicating strong discriminant validity of the measurement scale.

These results indicate that the construct validity and reliability in the measurement model meet the evaluation standards proposed by Fornell and Larcker, supporting the suitability of the sample data for empirical research in this study [58]. Additionally, Table 2 presents the means and standard deviations of the variables. The standard deviations of market orientation, business model innovation, entrepreneurial performance, and entrepreneurial effort are relatively small, with means of 4.217, 4.007, 3.593, and 4.073 respectively. This suggests that the respondents generally find the measurement items for each variable to be 'comparatively consistent'.

Table 2. Results of the reliability and validity tests

Subactive variables	Number of questions	Mean Value	standard deviation	Factor loads	Composition reliability	Average Variance Extracted	Differential validity			
							Market Orientation	Business model innovation	Entrepreneurship performance	Entrepreneurial Bricolage
Market Orientation	8	4.217	0.035	0.806-0.888	0.953	0.716	**0.846**			

Business model innovation	6	4.007	0.043	0.847-0.923	0.955	0.778	0.827***	**0.882**			
Entrepreneurship performance	8	3.593	0.036	0.810-0.838	0.946	0.688	0.511***	0.660***	**0.829**		
Entrepreneurial Bricolage	8	4.073	0.037	0.804-0.849	0.947	0.693	0.752***	0.813***	0.523***	**0.832**	

Note: * p <0.05, ** p <0.01, *** p <0.001, two-sided; the bold value is the square root of the potential E; the data below the diagonal is the value of the correlation.

This study employed Amos 24.0 software to conduct a confirmatory factor analysis and examine the discriminant validity of the variables, as shown in Table 3. The results indicate that the four-factor model exhibits the best fit indices (χ^2/df=1.665, SRMR=0.0339, RMSEA=0.048, CFI=0.968, TLI=0.966), significantly outperforming the other models and demonstrating a high level of discriminant validity among the variables. Additionally, the fit indices for the single-factor model are very poor (χ^2/df=7.129, SRMR=0.113, RMSEA=0.146, CFI=0.705, TLI=0.683), suggesting that the issue of common method bias is not significant.

Table 3. Results of the confirmatory factor analysis

model	χ^2	*df*	χ^2/*df*	*SRMR*	*RMSEA*	*CFI*	*TLI*
The four-factor model	664.369	399.000	1.665	0.034	0.048	0.968	0.966
The three-factor model[a]	1344.291	402.000	3.344	0.055	0.090	0.888	0.879
The two-factor model[b]	2354.470	404.000	5.828	0.098	0.130	0.768	0.750
Single factor model[c]	2887.140	405.000	7.129	0.113	0.146	0.705	0.683

Note: a represents the merger of entrepreneurial bricolage with market orientation ; b represents the merger of entrepreneurial bricolage with market orientation , and business model innovationwith enterprise performance; c represents the merger of all variables into one factor.

4.2 Direct Effect Testing

This study used a series of Process3 programs developed to estimate and explain the direct, indirect and modulating effects by Andrew F. Hayes [59]. The use of the Process procedure is available through the http://www.guilford.com/p/hayes3. For the test of direct effect and mediation effect, selected in the SPSS 26.0 software installed Process program and research mediation effect analysis model 45000 Bootstrap sampling to study, after the control of the enterprise age, company size, sales scale, industry, direct effect and mediation effect test as in Table 4, as shown in Table 5. MO, BI, EP, and EB are used to represent variable market orientation, business model innovation,entrepreneurial performance, and entrepreneurial bricolage; Years, Size, Sales, and Industry are used to represent control variable enterprise age, company size, sales scale, and industry. In Table 4, The results of Model1 indicate that, Entrepreneurial bricolage has no significant impact on entrepreneurial performance (Effect=0.051; CI=-0.087, 0.189), Assuming that the H1 validation does not hold, Business model innovation has a significant positive impact on entrepreneurial performance (Effect=0.456; CI=0.335, 0.576), Assume that H3 is verified; The results of Model2 indicate that, Entrepreneurial bricolage has a significant positive impact on business model innovation (Effect=0.864; CI=0.776, 0.952), Suppose that H2 is verified to hold.

Table 4. Direct effect test

Variables	Model1 (EP as DV)				Model2 (BI as DV)				Model 3 (EP as DV)			
	Effect	***SE***	**LLCI**	**ULCI**	**Effect**	***SE***	**LLCI**	**ULCI**	**Effect**	***SE***	**LLCI**	**ULCI**
constant	1.218	0.207	0.810	1.627	-0.033	0.201	-0.430	0.363	1.203	0.226	0.758	1.649
Years	0.050	0.033	-0.016	0.116	0.054	0.032	-0.010	0.117	0.075	0.036	0.003	0.146
Size	-0.012	0.028	-0.067	0.043	0.051	0.027	-0.002	0.104	0.011	0.030	-0.049	0.071
Sales	0.024	0.034	-0.043	0.091	0.017	0.033	-0.048	0.082	0.031	0.037	-0.042	0.104

Industry	0.109	0.035	0.039	0.179	0.126	0.034	0.060	0.192	0.167	0.038	0.092	0.241
EB	0.051	0.070	-0.087	0.189	0.864	0.045	0.776	0.952	0.445	0.050	0.346	0.543
BI	0.456	0.061	0.335	0.576								
F	34.163				95.723				25.141			
R^2	0.422				0.629				0.308			

4.3 Mediating Effect Testing

Based on the analysis of Model 3 in Table 4, it is evident that entrepreneurial bricolage significantly and positively influences entrepreneurial performance (Effect=0.445; CI=0.346, 0.543). However, upon the inclusion of business model innovation, and considering the results from Model 1 in Table 4, it can be observed that the regression coefficient of entrepreneurial bricolage on entrepreneurial performance decreases from 0.445 to 0.051, leading to a shift from a significant effect to an insignificant one. Further analysis through Table 5 reveals that bricolage has a significantly positive mediating effect on entrepreneurial performance (Effect=0.394; CI=0.299, 0.495), supporting Hypothesis 7. The direct effect is not significant (Effect=0.051; CI=-0.087, 0.189), while the total effect remains significantly positive (Effect=0.445; CI=0.346, 0.543). This suggests that business model innovation plays a crucial role as a full mediator in the relationship between bricolage and entrepreneurial performance.

Table 5 Mediator effect analysis

mediated relation	Path effect	Effect	SE(Boot SE)	LLCI(Boot LLCI)	ULCI(Boot ULCI)
EB→BI→EP	gross effect	0.445	0.050	0.346	0.543
	direct effect	0.051	0.070	-0.087	0.189
	indigo effect	0.394	0.049	0.299	0.495

4.4 Moderating Effect Testing

For testing moderation effects, the Process tool developed by Andrew F. Hayes was employed [59]. Using the Process3 program within the SPSS 26.0 software, the appropriate moderation analysis model 59 was selected to conduct 5000 rounds of bootstrap sampling for analyzing the moderating role of market orientation after controlling for variables such as company age, company size, sales scale, and industry. The results of the moderation effect tests are presented in Tables 6, 7, and the moderated mediation effects are shown in Table 8.

According to the results in Model 4 of Table 6, the interaction between market orientation and bricolage significantly and positively influences business model innovation (Effect=0.149; CI=0.015, 0.283). The positive moderation of market orientation demonstrates that it enhances the impact of entrepreneurial bricolage on business model innovation, confirming Hypothesis 4. As per the results from Model 5, the interaction between market orientation and bricolage significantly and positively affects entrepreneurial performance (Effect=0.745; CI=0.667, 0.823), indicating that market orientation positively moderates the relationship between bricolage and entrepreneurial performance, supporting Hypothesis 5. Additionally, the interaction between market orientation and business model innovation significantly and positively impacts entrepreneurial performance (Effect=0.673; CI=0.598, 0.748), signifying that market orientation positively moderates the relationship between business model innovation and entrepreneurial performance, confirming Hypothesis 6.

Table 6: Test of regulatory effects

Variables	Model 4(BI as DV)				Model5 (EP as DV)			
	Effect	SE	LLCI	ULCI	Effect	SE	LLCI	ULCI
constant	-0.423	0.116	-0.652	-0.194	3.100	0.049	3.003	3.196
Years	0.029	0.027	-0.025	0.082	0.015	0.011	-0.007	0.037
Size	0.032	0.023	-0.013	0.077	-0.024	0.009	-0.042	-0.005
Sales	0.025	0.028	-0.030	0.080	0.021	0.011	-0.002	0.043
Industry	0.097	0.029	0.041	0.154	0.023	0.012	-0.001	0.047
EB	0.490	0.052	0.388	0.592	0.209	0.025	0.161	0.258
MO	0.610	0.056	0.500	0.721	0.427	0.028	0.372	0.482
BI					0.280	0.025	0.231	0.329

EB×MO	0.149	0.068	0.015	0.283	0.745	0.040	0.667	0.823
BI×MO					0.673	0.038	0.598	0.748
F		113.944				447.222		
R^2		0.740				0.935		

In this study, a simple slope analysis of the regulatory effect was performed based on the market-oriented mean and one standard deviation. The results are presented in Table 7.

When MO=M-1SD, the interaction between market orientation and bricolage significantly and positively affects business model innovation (Effect=0.401; CI=0.277, 0.525). When MO=M, the interaction between market orientation and bricolage significantly and positively affects business model innovation (Effect=0.490; CI=0.388, 0.592). When MO=M+1SD, the interaction between market orientation and bricolage significantly and positively influences business model innovation (Effect=0.579; CI=0.443, 0.715). This indicates that the impact of bricolage on business model innovation increases with higher levels of market orientation.

Similarly, when MO=M-1SD, the interaction between market orientation and bricolage negatively affects entrepreneurial performance (Effect=-0.236; CI=-0.300, -0.173). When MO=M, the interaction has a significantly positive impact on entrepreneurial performance (Effect=0.209; CI=0.161, 0.258). When MO=M+1SD, the interaction between market orientation and bricolage significantly and positively impacts entrepreneurial performance (Effect=0.655; CI=0.585, 0.726). This suggests that the effect of bricolage on entrepreneurial performance shifts from negative to positive with increasing market orientation. Moreover, when MO=M-1SD, the interaction between market orientation and business model innovation negatively affects entrepreneurial performance (Effect=-0.122; CI=-0.192, -0.052). When MO=M, the interaction has a significantly positive impact on entrepreneurial performance (Effect=0.280; CI=0.231, 0.329). When MO=M+1SD, the interaction between market orientation and business model innovation significantly and positively impacts entrepreneurial performance (Effect=0.683; CI=0.620, 0.745). This suggests that the effect of business model innovation on entrepreneurial performance shifts from negative to positive with increasing market orientation.When MO=M-1SD, the interaction term of market orientation and business model innovation has a significant negative impact on entrepreneurial performance (Effect=-0.122; CI=-0.192,-0.052); When MO=M, the interaction term between market orientation and business model innovation has a significant positive impact on entrepreneurial performance (Effect=0.280; CI=0.231,0.329); When MO=M+1SD, the interaction term between market orientation and business model innovation has a significant positive impact on entrepreneurial performance (Effect=0.683; CI=0.620,0.745); At the same time, it can be inferred that with the increase of market orientation, the impact of business model innovation on entrepreneurial performance changes from negative to positive.

Table 7. Analysis of the moderating effects

Mediated Relation	**Index**	**Effect**	**SE**	**LLCI**	**ULCI**
EB×MO→BI	Effect1(MO=M-1SD)	0.401	0.063	0.277	0.525
	Effect2(MO=M)	0.490	0.052	0.388	0.592
	Effect3(MO=M+1SD)	0.579	0.069	0.443	0.715
EB×MO→EP	Effect1(MO=M-1SD)	-0.236	0.032	-0.300	-0.173
	Effect2(MO=M)	0.209	0.025	0.161	0.258
	Effect3(MO=M+1SD)	0.655	0.036	0.585	0.726
BI×MO→EP	Effect1(MO=M-1SD)	-0.122	0.036	-0.192	-0.052
	Effect2(MO=M)	0.280	0.025	0.231	0.329
	Effect3(MO=M+1SD)	0.683	0.032	0.620	0.745

In order to clearly present the moderating effect of market orientation (MO), based on the analysis in Table 7, this study plotted moderation effect diagrams using one standard deviation above and below the mean of entrepreneurial bricolage (EB) as benchmarks. The results are shown in Figure 2, Figure 3, and Figure 4, and the graphical results are consistent with the analysis and conclusions mentioned above.

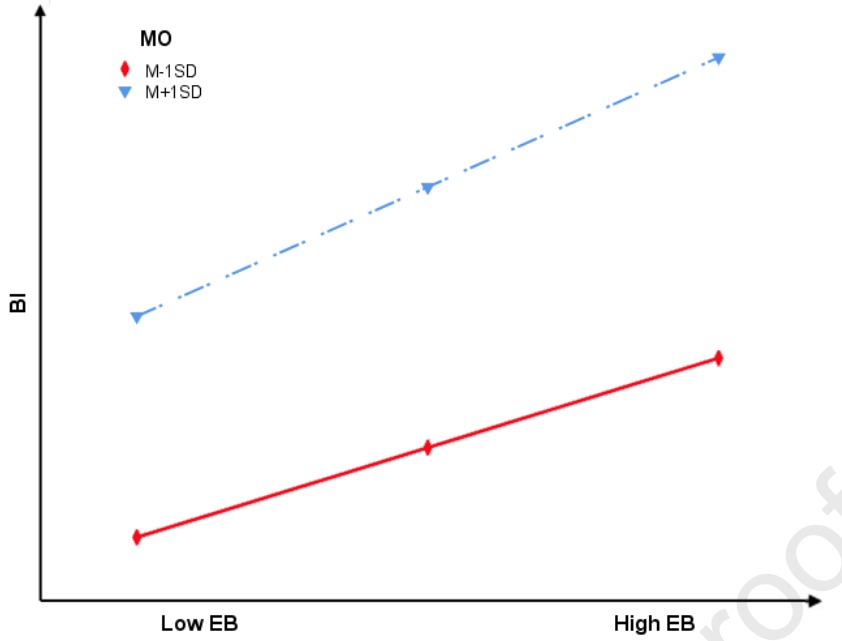

Figure 2: Moderating Effect of Market Orientation on the Relationship between Entrepreneurial Bricolage and Business Model Innovation.

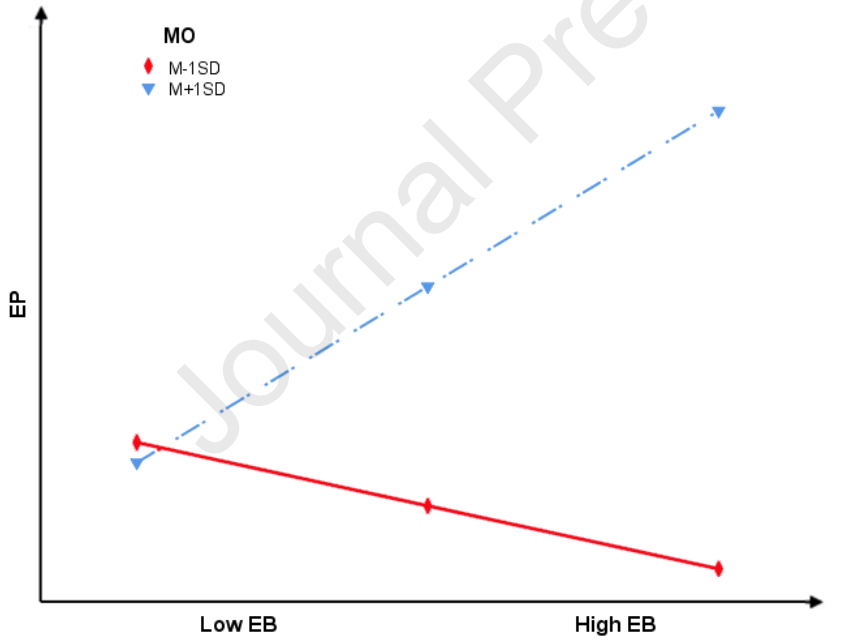

Figure 3: Moderating Effect of Market Orientation on the Relationship between Entrepreneurial Bricolage and Entrepreneurial Performance

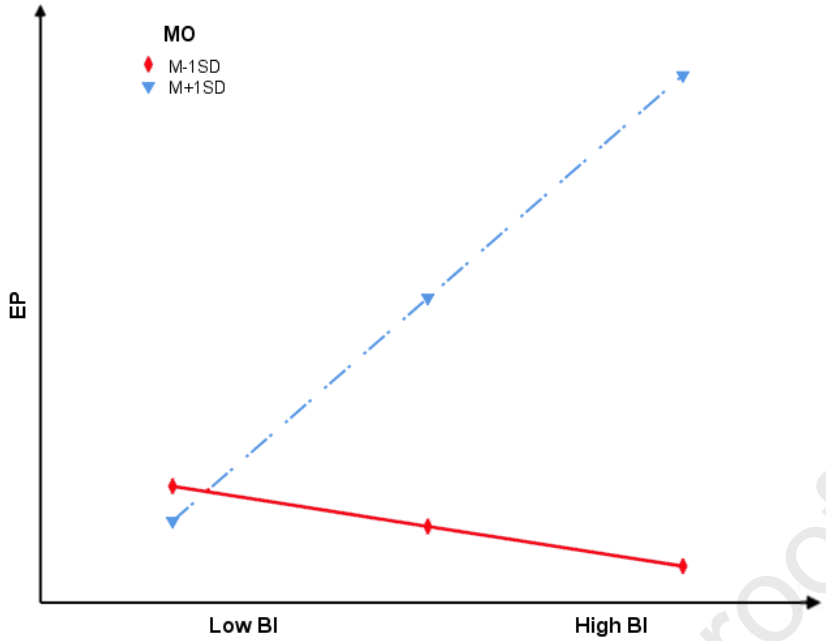

Figure 4: Moderating Effect of Market Orientation on the Relationship between Business Model Innovation and Entrepreneurial Performance

4.5 Moderated Mediation Effect Test

In this study, a moderated mediation effect analysis was further conducted, using the mean and values one standard deviation above and below the mean of market orientation (MO) as the reference points. The results are presented in Table 8.

When MO=M, it is observed that market orientation positively moderates the indirect effect of bricolage on entrepreneurial performance through business model innovation (Effect=0.137, CI=0.100, 0.178), confirming Hypothesis 8. When MO=M-1SD, market orientation negatively moderates the indirect effect of bricolage on entrepreneurial performance through business model innovation (Effect=-0.049, CI=-0.079, -0.020). When MO=M+1SD, market orientation positively moderates the indirect effect of entrepreneurial bricolage on entrepreneurial performance through business model innovation (Effect=0.395, CI=0.311, 0.480). This suggests that as market orientation increases, the impact of bricolage through business model innovation on entrepreneurial performance shifts from negative to positive. This pattern of change is also visually depicted in Figure 5.

When comparing the moderated mediation effects at different levels of market orientation, it is observed that when comparing Effect2 with Effect1, Effect2 is significantly greater than Effect1 (Effect2-Effect1=0.186, CI=0.143, 0.228). Similarly, when comparing Effect3 with Effect1, Effect3 is significantly greater than Effect1 (Effect3-Effect1=0.444, CI=0.353, 0.532). Furthermore, when comparing Effect3 with Effect2, Effect3 is significantly greater than Effect2 (Effect3-Effect2=0.258, CI=0.199, 0.317). This suggests variations in the moderating effects exerted by different levels of market orientation.

Additionally, Table 8 analyzes the moderated direct effects. When MO=M, bricolage has a significantly positive effect on entrepreneurial performance (Effect=0.209, CI=0.161, 0.258). When MO=M-1SD, bricolage has a significantly negative effect on entrepreneurial performance (Effect=-0.236, CI=-0.300, -0.173). When MO=M+1SD, bricolage has a significantly positive effect on entrepreneurial performance (Effect=0.655, CI=0.585, 0.726). Consequently, it can be inferred that with increasing market orientation, the influence of bricolage on entrepreneurial performance transitions from negative to positive.

Table 8: Analysis of mediating mediating mediating effect

Outcome	Index	Effect	SE(Boot SE)	LLCI(Boot LLCI)	ULCI(Boot ULCI)
Conditional direct effects	Effect1(MO=M-1SD)	-0.236	0.032	-0.300	-0.173
	Effect2(MO=M)	0.209	0.025	0.161	0.258
	Effect3(MO=M+1SD)	0.655	0.036	0.585	0.726

Conditional indirect effects	Effect1(MO=M-1SD)	-0.049	0.015	-0.079	-0.020
	Effect2(MO=M)	0.137	0.020	0.100	0.178
	Effect3(MO=M+1SD)	0.395	0.044	0.311	0.480
Pairwise contrasts between conditional indirect effects	Eff2-Eff1	0.186	0.022	0.143	0.228
	Eff3-Eff1	0.444	0.046	0.353	0.532
	Eff3-Eff2	0.258	0.030	0.199	0.317

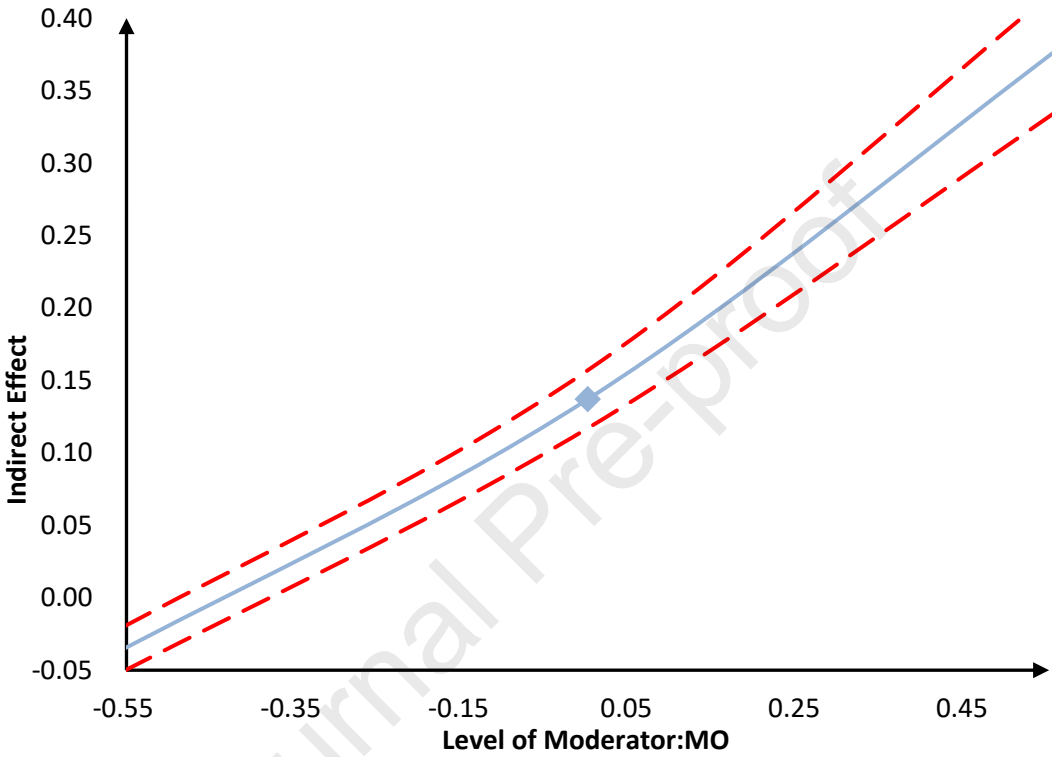

Figure 5 Conditional Indirect Effect for Market oriented

4.6 Robustness test

This study conducted a robustness check on the constructed model to further validate our main results. According to the document "Notice of the National Bureau of Statistics on the Arrangement of the 2010 Statistical Annual Report and 2011 Regular Statistical Report System" (Guo Tong Zi [2010] No. 87), enterprises above designated size mainly refer to industrial legal entities with an annual main business income of 20 million yuan or more. To better study start-up enterprises, this article selects samples with a company size of less than 20 million yuan as the research object for robustness analysis, with a total of 203 data, accounting for approximately 70% of the original sample proportion. The robustness results are shown in Tables 9, 10, 11and 12, indicating that hypothesis H1 is not supported and hypothesis H2-H8 is supported. Therefore, we found that the results of the robustness test are consistent with the previous results, which strongly supports our main results.

Table 9 Robustness Test for Direct Effects

Variables	Model6 (EP as DV)				Model7 (BI as DV)				Model8 (EP as DV)			
	Effect	SE	LLCI	ULCI	Effect	SE	LLCI	ULCI	Effect	SE	LLCI	ULCI
constant	1.039	0.271	0.505	1.572	0.03	0.241	-0.445	0.505	1.024	0.244	0.543	1.505
Years	0.034	0.044	-0.054	0.121	0.022	0.039	-0.056	0.099	0.023	0.04	-0.056	0.102
Size	0.004	0.036	-0.066	0.075	0.074	0.032	0.011	0.137	-0.032	0.033	-0.096	0.033
Sales	0.029	0.072	-0.113	0.171	0.008	0.064	-0.118	0.135	0.025	0.065	-0.103	0.153
Industry	0.151	0.045	0.062	0.24	0.104	0.04	0.025	0.183	0.1	0.041	0.018	0.181

EB	0.518	0.06	0.4	0.637	0.864	0.054	0.759	0.97	0.093	0.083	-0.07	0.256
BI									0.492	0.072	0.35	0.634
F		21.162				66.753				29.459		
R2		0.349				0.629				0.474		

Table 10 Robustness test of mediating effect

Mediating relationship	**Path effect**	**Effect**	**SE(Boot SE)**	**LLCI(Boot LLCI)**	**ULCI(Boot ULCI)**
EB→BI→EP	Total effect	0.518	0.06	0.4	0.637
	Direct effect	0.093	0.083	-0.07	0.256
	Indirect effect	0.425	0.058	0.317	0.543

Table 11 Robustness test of regulatory effects

Variables	Model 9(BI as DV)				Model10 (EP as DV)			
	Effect	SE	LLCI	ULCI	Effect	SE	LLCI	ULCI
constant	-0.476	0.15	-0.772	-0.181	3.108	0.065	2.979	3.237
Years	0.012	0.033	-0.054	0.078	0.021	0.014	-0.007	0.049
Size	0.054	0.027	0.001	0.108	-0.019	0.012	-0.042	0.004
Sales	0.045	0.054	-0.062	0.153	0.011	0.023	-0.035	0.056
Industry	0.1	0.034	0.032	0.167	0.024	0.015	-0.005	0.054
EB	0.489	0.064	0.364	0.615	0.236	0.031	0.175	0.296
MO	0.628	0.07	0.49	0.766	0.427	0.036	0.357	0.498
BI					0.309	0.03	0.249	0.369
EB×MO	0.192	0.083	0.028	0.356	0.725	0.05	0.626	0.823
BI×MO					0.679	0.048	0.585	0.773
F	78.317				311.601			
R2	0.738				0.936			

Table 12 Robustness test for moderated mediating effects

Outcome	**Index**	**Effect**	**SE(Boot SE)**	**LLCI(Boot LLCI)**	**ULCI(Boot ULCI)**
Conditional direct effects	Effect1(MO=M-1SD)	-0.033	0.015	-0.064	-0.005
	Effect2(MO=M)	0.151	0.025	0.104	0.203
	Effect3(MO=M+1SD)	0.424	0.056	0.315	0.537

5.Discussion

Duan Haixia et al. found that entrepreneurial bricolage has a fully indirect effect on entrepreneurial performance through business model innovation [50]. Firstly, empirical research confirmed that entrepreneurial bricolage has a significantly positive impact on business model innovation, a conclusion consistent with Guo et al.; However, Guo et al.primarily focused on analyzing the relationship between market orientation and business model innovation, treating entrepreneurial bricolage merely as a mediator between the two without delving into the dimensions of entrepreneurial bricolage and their distinct impacts on business model innovation ; Building upon Guo et al., this study further validates this finding [49].

The bricolage process can be understood as a process innovation strategy. Through a continuous trial-and-error process of bricolage, existing resources are optimally combined, leading to innovation in resource allocation processes, which in turn promotes business model innovation [60]. Secondly, the empirical analysis affirmed that business model innovation has a significantly positive impact on entrepreneurial performance, consistent with Yan Jing et al. [61]. However, Yan Jing et al. used a novel business model scale designed by Zott and Amit to measure business model innovation, rather than a specific business model innovation scale [30,61]. Therefore, this study

revised and further validated this conclusion based on the classical scale developed by Hunt et al. and incorporating findings from Dubey et al. [54,55].

Finally, the research results indicate that entrepreneurial bricolage exerts a significant fully mediated effect on entrepreneurial performance through business model innovation. This finding contradicts Li Xinyi's mention of a "partial mediation" perspective[51]. However, Baker and Nelson only conducted theoretical analysis without further empirical analysis; This study enriches the entrepreneurial bricolage process model proposed by Baker and Nelson, further illustrating the presence of a mediating pathway in promoting performance improvement, namely business model innovation [16]. Entrepreneurial bricolage strategies, through the effective combination and reuse of resources related to new opportunities, help companies develop new content, structures, governance affairs, and capture new opportunities, making them one of the key drivers of business model innovation [49]. Moreover, enhanced performance of new startups can be achieved through business model innovation [48].

Market orientation moderates the relationship between entrepreneurial bricolage, business model innovation, and entrepreneurial performance. Firstly, market orientation positively moderates the effect of entrepreneurial bricolage on business model innovation. Resource scarcity is becoming a new norm in the innovation process, and effectively avoiding resource constraints, creatively using available resources, and solving problems with new methods require market situational awareness. Under the premise of being market-oriented with a keen focus on core market demand, companies can better manage their external market relationships and break free from resource constraints in their entrepreneurial bricolage activities, ultimately leading to business model innovation. Secondly, market orientation positively moderates the impact of entrepreneurial bricolage on entrepreneurial performance. While entrepreneurial bricolage itself does not have a direct and significant impact on entrepreneurial performance, under the moderating influence of market orientation, the effect of entrepreneurial bricolage on entrepreneurial performance shifts from negative to positive. Furthermore, market orientation positively moderates the impact of business model innovation on entrepreneurial performance. The alignment and interaction between market orientation and business model innovation can act as a catalyst for entrepreneurial performance. Business model innovation can sustainably achieve long-term entrepreneurial performance through the adjustment provided by market orientation, enabling the dynamic exploration of the effects of new business model innovations on entrepreneurial performance. Lastly, market orientation positively moderates the indirect effect of entrepreneurial bricolage on entrepreneurial performance through business model innovation. Under the moderation of market orientation, the mediating effect of entrepreneurial bricolage through business model innovation on entrepreneurial performance is positively influenced. Market orientation has a positive moderating effect on the "entrepreneurial bricolage - business model innovation - entrepreneurial performance" process.

5.1.Implications for theory

Prior research has already recognized the individual effectiveness of entrepreneurial bricolage, business model innovation, and market orientation in promoting entrepreneurial performance [19,62,63,64]. However, the partial or complete interplay between these factors has to a large extent remained unexplored. This study, within the context of entrepreneurial bricolage, business model innovation, market orientation, and entrepreneurial performance, has contributed to existing knowledge in several ways.

Firstly, this research enriches the study of entrepreneurship theory by introducing market orientation into the realm of entrepreneurial analysis and enhances our understanding of entrepreneurial performance. Before this study, there was limited research considering market factors in entrepreneurial performance, even fewer studies that introduced market orientation as a moderating variable in the study of entrepreneurial behavior, and rare instances where entrepreneurial bricolage, business model innovation, market orientation, and entrepreneurial performance were studied within a single theoretical framework. Through empirical analysis, this study clarifies the boundaries and conditions under which entrepreneurial bricolage and business model innovation impact entrepreneurial performance, demonstrating their significance in the context of market orientation.

Secondly, the results of this study confirm that business model innovation acts as a full mediator between entrepreneurial bricolage and entrepreneurial performance. Entrepreneurial bricolage cannot directly enhance entrepreneurial performance; instead, it requires the promotion of business model innovation to improve entrepreneurial performance. This conclusion contradicts the findings of Su Xiaofeng et al. and extends the research on the mechanisms behind the reconstruction of corporate performance [65].

Lastly, this study addresses the research gap regarding the influence of market orientation on startups. Previous analyses primarily examined the impact of entrepreneurial bricolage and business model innovation on entrepreneurial performance. The model presented in this paper provides a comprehensive view of market orientation as a moderating factor in the relationship between entrepreneurial bricolage and entrepreneurial performance. These findings indicate that the impact of entrepreneurial bricolage on entrepreneurial performance through business model innovation is moderated by market orientation, a relationship previously uncharted. This study fills this gap by elucidating the specific mechanisms through which market orientation influences entrepreneurial performance.

5.2.Implications for practice

The practical contribution of this study lies in two aspects. Firstly, enterprises need to recognize market orientation reasonably and adjust their strategies and operating processes according to the changes in the market. Enterprises should not be afraid of market changes but should fully utilize them and actively engage in entrepreneurial bricolage activities and business model innovation, allowing enterprises to break free from resource constraints and achieve performance improvement in turbulent environments. Secondly, the process of business model innovation is an experimental process. When the outcome of experiment entrepreneurs should not blindly deny the model but should reflect on whether they have truly allocated enterprise resources to promote business model innovation. Therefore, the entrepreneurial bricolage strategy that emphasizes creative resource integration is an innovative mechanism that provides possibilities and conveniences for enterprise business model innovation, allowing enterprises to achieve performance improvement through innovation.

5.3.Limitations and future directions

While this study has achieved certain results in theoretical derivation and empirical testing, there are still limitations in the research. Firstly, the study only selects entrepreneurial enterprises within Hubei Province as research samples, with a relatively small sample size, which might reduce the representativeness of the research conclusions. In future studies, in addition to increasing the sample size through supplementary surveys, resources could be focused on a few specific industries for more targeted research. Secondly, this paper only considers the moderating effect of the exogenous variable of market orientation on the relationship between entrepreneurial bricolage, business model innovation, and entrepreneurial performance. It does not account for the influence of endogenous variables on this relationship. Future research could delve deeper by incorporating endogenous regulatory variables such as organizational culture and structure for a more comprehensive investigation.

6.Conclusion

This study links entrepreneurial bricolage, business model innovation, and entrepreneurial performance through the regulation of market orientation, and uniquely constructs and explores a moderated mediation model. The study reveals several important findings: (1) Entrepreneurial bricolage significantly and positively impacts business model innovation. (2) Business model innovation, in turn, has a significant and positive effect on entrepreneurial performance. It also serves as a complete mediator between entrepreneurial bricolage and entrepreneurial performance. (3) Market orientation plays a crucial role in regulating the impact of entrepreneurial bricolage on business model innovation. It also positively regulates the impact of business model innovation on entrepreneurial performance. (4) Market orientation further exhibits a significant regulatory effect on the impact of entrepreneurial bricolage on entrepreneurial performance, acting as a mediator in this relationship. In summary, entrepreneurial bricolage, business model innovation, and market orientation are interconnected factors that influence entrepreneurial performance in a positive and significant manner.

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Conflict of interest

On behalf of all authors, the corresponding author states that there is no conflict of interest.

Authors'contributions

All authors contributed equally to the study conception and design, Al authors read and approved the final manuscript.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional

and/or national research committee and with

Informed consent

Informed consent was obtained from all individual participants included in the study.

Author statement

Wu Shaoling made substantial contributions to conception and design; Luo Yingjie made substantial contributions to acquisition of data; Zhang Han made substantial contributions to analysis and interpretation of data: All authors have been involved in drafting the manuscript or revising it critically for important intellectual content; All authors have given final approval to the version to be published, All authors take public responsibility for appropriate portions of the content and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Data availability statement

The datasets in the study are available from corresponding author on reasonable request.

References

[1] Deng, W., Liang, Q., & Fan, P. (2018). Research on the evolution and future prospects of entrepreneurial bricolage. Research and Development Management, 30(3), 145-156.

[2] Zhang, X. (2017). Entrepreneurial management. Tsinghua University Press.

[3] Read, S. (2011). Effectual entrepreneurship. Routledge.

[4] Senyard, J. M., Baker, T., & Steffens, P. R. (2010). Entrepreneurial bricolage and firm performance: Moderating effects of firm change and innovativeness. Paper presented at the Annual Meeting of the Academy of Management, Montreal, Canada.

[5] Zhang, Y., Li, Y., & Li, H. (2020). Entrepreneurial bricolage and firm performance: The mediating role of business model innovation. Journal of Business Research, 106, 1-10.

[6] Gupta, V. K., Turban, D. B., Wasti, S. A., & Sikdar, A. (2020). Entrepreneurial bricolage and firm performance: The mediating role of business model innovation. Journal of Business Research, 88, 344-356.

[7] Beckett, R. C. (2016). Entrepreneurial bricolage: Developing recipes to support innovation. International Journal of Innovation Management, 20(7), 1-17.

[8] Lumpkin, G. T., Cogliser, C. C., & Schneider, D. R. (2019). Understanding and measuring autonomy in entrepreneurship: A review, synthesis, and extension. Journal of Management, 45(1), 96-120.

[9] Casadesus-Masanell, R., & Ricart, J. E. (2010). From strategy to business models and onto tactics. Long Range Planning, 43(2), 195-215.

[10] Slater, S. F., Hult, G. T. M., & Olson, E. M. (2014). Factors influencing the relative importance of marketing strategy creativity and marketing strategy implementation effectiveness. Industrial Marketing Management, 43(3), 483-492.

[11] Narver, J. C., & Slater, S. F. (1990). The effect of a market orientation on business profitability. Journal of Marketing, 54(4), 20-35.

[12] Ashwin, J. W. (2016). When does customer orientation hinder (help) radical product innovation? The role of organizational. Journal of Product Innovation Management, 33(4), 435-454.

[13] Li, F., & Zhu, Z. (2014). Empirical evidence of entrepreneurial bricolage and its efficacy based on the mediating role of dynamic capability. Management World, 11(4), 562-568.

[14] Zott, C., & Amit, R. (2009). Business model design: An activity system perspective. Long Range Planning, 43(2), 216-226.

[15] Zhang, X., Zhou, X., & Bao, J. (2020). Political skills of technopreneurs and entrepreneurial performance: A perspective of dynamic capabilities. Management World, 17(8), 1179-1187.

[16] Baker, T., & Nelson, R. E. (2005). Creating something from nothing: Resource construction through entrepreneurial bricolage. Administrative Science Quarterly, 50(3), 329-366.

[17] Salunke, S., Weerawardena, J., & McColl-Kennedy, J. R. (2013). Competing through service innovation: The role of bricolage and entrepreneurship in project-oriented firms. Journal of Business Research, 66(8), 1085-1097.

[18] Zhu, Z., & Li, F. (2017). Empirical study on entrepreneurial bricolage, relationship trust and new enterprise performance. Scientific Research Management, (07), 108-116.

[19] Yi, Z., Xie, Y., & Zhang, C. (2019). Research on entrepreneurial performance of small and micro technology enterprises: A perspective based on previous experience. Scientific Research Management, 40(07), 235-246.

[20] Yan, H., & Sun, Y. (2019). Research on the relationship between dual entrepreneurial learning and entrepreneurial bricolage and the growth performance of new enterprises. Journal of Management, 32(03), 41-51.

[21] Tong, X., Yi, Z., & Guan, L. (2022). Research on the influence mechanism of entrepreneurial bricolage on entrepreneurial performance of family farms: Based on the analysis of hierarchical regression and fsQCA. World Agriculture, 2022(12), 107-119.

[22] Wang, Z., & Cheng, M. (2022). Prosocial motivation, entrepreneurial bricolage and entrepreneurial performance: Regulation of environmental dynamics. Research and Development Management, 34(04), 127-140.

[23] Garud, R., & Karne, P. (2003). Bricolage versus breakthrough: Distributed and embedded agency in technology entrepreneurship. Research Policy, 32(2), 277–300.

[24] Fuglsang, L. (2010). Bricolage and invisible innovation in public service innovation. Journal of Innovation Economics & Management, (1), 67-87.

[25] Baker, T., Miner, A. S., & Eesley, D. T. (2003). Improvising firms: Bricolage, account giving and improvisational competencies in the founding process. Research Policy, 32(2), 255–276.

[26] Xu, S. (2022). Value chain restrictions, entrepreneurial bricolage and new rural online retail enterprises business model innovation. Business Economics Research, (17), 142-145.

[27] Wang, X. (2022). Research on the relationship between entrepreneurial bricolage, entrepreneurial learning and business model innovation [Doctoral dissertation, Inner Mongolia University of Technology].

[28] Markides, C. (2006). Disruptive innovation: In need of better theory. Journal of Product Innovation Management, 23(1), 19–25.

[29] Amit, R., & Zott, C. (2001). Value creation in E-business. Strategic Management Journal, 22(6/7), 493–520.

[30] Zott, C., & Amit, R. (2007). Business model design and the performance of entrepreneurial firms. Organization Science, 18(2), 181-199.

[31] Wang, X., Li, D., & Zhang, X. (2010). Are business models a driver of performance differences between companies? ANOVA analysis based on China. Nanjing Social Science, (5), 20-26.

[32] Wen, L., & He, J. (2012). Empirical study on the relationship between entrepreneurial resources, business model and entrepreneurial performance. Southeastern Academic, (5), 116-128.

[33] Constantinides, P., Henfridsson, O., & Parker, G. G. (2018). Platforms and infrastructures in the digital age. Information Systems Research, 29(2), 381-400.

[34] Luo, X., Xiang, G., Ning, P., & Cheng, C. (2017). How does business model innovation affect start-up performance? The role of legitimacy and policy orientation. Scientific Research, 35(07), 1073-1084.

[35] Chi, K., & Shao, Y. (2020). Business model innovation, resource integration and start-up performance. Foreign Economy and Management, 42(03), 3-16.

[36] Tong, Z., Li, P., & Yang, L. (2022). The impact of the matching of business model innovation and technology innovation on the performance of latecomer enterprises: An empirical study of text analysis of annual report. Scientific and Technological Progress and Countermeasures, 39(11), 84-93.

[37] Ngo, L. V., & Cass, A. (2012). In search of innovation and customer-related performance superiority: The role of market orientation, marketing capability, and innovation capability interactions. Journal of Product Innovation Management, 29(5), 861-877.

[38] Yuan, Y., Jiang, J., & Cheng, X. (2016). The regulatory role of dynamic capacity and innovation type: Strategy orientation. Science and Science and Technology Management, 37(04), 45-58.

[39] Tong, Q. (2021). Big data capability, business model innovation and enterprise performance: The regulatory role of strategic guidance [Doctoral dissertation, Hangzhou Dianzi University].

[40] Wang, G., Qin, L., Xing, R., et al. Research on the internal mechanism of the transformation of new enterprise entrepreneurship orientation into growth performance — Case.

[41] Qin, J. (2012). Research on the development and empirical application of entrepreneurial bricolage theory from the perspective of

entrepreneurship management. Management Review, 24(9), 94-102.

[42] Halme, M., Lindeman, S., & Linna, P. (2012). Innovation for inclusive business: Intrapreneurial bricolage in multinational corporations. Journal of Management Studies, 49(4), 743-784.

[43] Slater, S. F., & Narver, J. C. (1995). Market orientation and the learning organization. Journal of Marketing, 59(3), 63-74.

[44] Guo, H., & Shen, R. (2012). Research on the impact of environmental inclusiveness and uncertainty on enterprise business model innovation. Economics and Management Research, 2012(10), 97-104.

[45] Miller, D., & Chen, M. J. (1994). Sources and consequences of competitive inertia: A study of the U.S. airline industry. Administrative Science Quarterly, 39(1), 1-23.

[46] Zhang, J., An, W., You, C., & Wu, L. (2015). Dual dual and alternative innovation based on multiple case studies. Journal of Management, 12(05), 647-656.

[47] Yu, X., Chen, Y., Lin, N., et al. (2017). Redundant resources, entrepreneurial bricolage, and business performance. Journal of Southeast University (Philosophy and Social Sciences edition), 19(4), 52-62.

[48] Guo, H., & Shen, R. (2014). How to transform entrepreneurial opportunities into enterprise performance — The intermediary role of business model innovation and the regulating role of market environment. Economic Theory and Economic Management, 34(3), 70-83.

[49] Guo, H., Su, Z., & Ahlstrom, D. (2016). Business model innovation: The effects of exploratory orientation, opportunity recognition, and entrepreneurial bricolage in an emerging economy. Asia Pacific Journal of Management, 33(2), 533-549.

[50] Duan, H., Yi, Z., & Su, X. (2021). Relationship between entrepreneurial bricolage, business model innovation and family farm entrepreneurial performance — Based on a typical case analysis in Hunan Province. China Rural Observation, 2021(06), 26-46.

[51] Li, X. (2023). Research on the relationship between users' entrepreneurial resource development, business model innovation and entrepreneurial performance [Doctoral dissertation, Guangxi Normal University].

[52] Johnson, M. W., Christensen, C. M., & Kagermann, H. (2008). Reinventing your business model. Harvard Business Review, 86(12), 51-59.

[53] Narver, J. C., Slater, S. F., & Maclachlan, D. L. (2004). Responsive and proactive market orientation and new-product success. The Journal of Product Innovation Management, 21(5), 334-347.

[54] Hunt, S. D., & Morgan, R. M. (1995). The comparative advantage theory of competition. Journal of Marketing, 59(2), 1-15.

[55] Dubey, R., Gunasekaran, A., Childe, S. J., et al. (2019). Big data analytics and artificial intelligence pathway to operational performance under the effects of entrepreneurial orientation and environmental dynamism: a study of manufacturing organisations. International Journal of Production Economics, 218, 339-351.

[56] Senyard, J., Baker, T., & Davidsson, P. (2009). Entrepreneurial Bricolage: Towards Systematic Empirical Testing. Frontiers of Entrepreneurship Research, 29(5), 1-15.

[57] Chandler, G. N., & Hanks, S. H. (1993). Measuring the performance of emerging businesses: A validation study. Journal of Business Venturing, 8(5), 391-408.

[58] Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. Journal of Marketing Research, 18, 382-389.

[59] Hayes, A. F. (2017). Introduction to mediation, moderation, and conditional process analysis: A regression-based approach. Guilford Publications.

[60] Sun, R., & Zhou, F. (2017). Research on the relationship between corporate social connection, resource pooling, and business model innovation. Journal of Management, 2017(12), 1811-1818.

[61] Yan, J., Liu, Z., & Zheng, X. (2016). Transformational leadership, business model innovation and enterprise performance under the dynamic regulation of the environment. Journal of Management, 13(8), 1208-1214.

[62] Li, W., Wang, Q., & Yang, X. (2021). Research on the mechanism of dual-driven entrepreneurial performance in the new enterprise market: the intermediary effect of business model innovation. Management Review, 33(03), 118-128.

[63] Jiang, B., Zhang, W., & Cheng, J. (2021). Research on the institutional environment, entrepreneurial bricolage and business model innovation of new enterprises — Regulation effect based on decision-making preference. Soft Science, 35(09), 124-130.

[64] He, H., & Yuan, Y. (2019). Research on dual-dimensional market orientation, local network embedding and entrepreneurial performance of overseas talents in China. Scientific and Technological Progress and Countermeasures, 36(01), 105-114.

[65] Su, X., Cai, X., & Jiang, X., et al. (2020). Study on the impact of resource pooling on the entrepreneurial performance of family farms. Asia-Pacific Economy,(06), 124-132.

Declaration of interests

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