

An Empirical Study on the Dynamic Impact of the Value Co-Creation Model on Business Model Innovation within a Digital-Driven Business Ecosystem

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Abstract. Against the backdrop of widespread penetration of digital technology and continuous promotion of the "Digital China" strategy, the digital driven business ecosystem is increasingly becoming an important support for enterprises to achieve business model innovation. This article focuses on the dynamic impact mechanism of value co creation models on business model innovation in a digital driven environment. It systematically reviews the current research progress at home and abroad, pointing out that existing research mostly stays at a static perspective and lacks research on how value co creation drives the continuous evolution of business models in dynamic ecological interactions. Based on this, this article starts from the perspective of theoretical mechanisms and introduces market competition as a moderating variable to reveal the constraining effect of the external environment on this mechanism. The study proposes that the intensity of value co creation can promote the systematic restructuring of enterprise business models by promoting knowledge integration, resource restructuring, and organizational collaboration. Empowering enterprise digital technology plays a mediating role in this process, significantly enhancing co creation efficiency and innovation capabilities. This study not only expands the theoretical boundaries of business ecosystems and business model innovation but also provides theoretical support and practical reference for enterprises to formulate value co creation and innovation strategies in complex and dynamic digital ecosystems.

Keywords: Digital driven; Business ecosystem; Value co creation model; Business model innovation

1. Introduction

With the rapid development and widespread penetration of digital technology, the global business environment is undergoing profound changes (Behie et al., 2023). The continuous iteration of emerging technologies not only drives the digital reconstruction of industrial forms but also presents new challenges and opportunities for enterprises in resource acquisition, value creation, and strategic synergy (Solaimani, 2024; Čyras and Nalivaikè, 2024). In this context, more and more enterprises are breaking through traditional organizational boundaries, leveraging digital platforms, data resources, and technological means to build a digitally driven business ecosystem characterized by deep collaboration among multiple stakeholders (Steiber and Alvarez, 2024). This type of ecosystem exhibits characteristics of openness, dynamism, and complexity. Through the continuous expansion and iterative evolution of value networks, it reshapes the interaction logic between enterprises and customers, partners, and competitors and greatly promotes innovative changes in business models (Alam, 2021).

In the digital driven ecosystem, value co creation is gradually replacing the enterprise centered value transmission model and becoming the dominant value creation mechanism (Quaye and Mensah, 2019). The traditional business model emphasizes enterprise led resource integration and delivering value to customers, while in the digital ecosystem, various participants engage in cross-border cooperation and value co creation based on shared resources and co construction scenarios. The value creation process increasingly relies on the collaborative participation and dynamic interaction of multiple parties, providing a continuous source of momentum for the continued evolution of the business model (Watanabe et al., 2018). With the rapid development of digital technology and the continuous promotion of the national "Digital China" strategy, Chinese enterprises are accelerating the pace of business model innovation, attempting to achieve transformation and upgrading by restructuring the ways of value creation, transmission, and acquisition (Hoch and Brad, 2021). Traditional enterprises are actively transforming into digital ecosystems, while emerging enterprises are rapidly gathering resources and connecting multiple stakeholders through digital platforms to promote cross-border integration and value co creation (Halaburda and Levina, 2024).

Although Chinese enterprises have achieved certain results in business model innovation, they still face structural and institutional challenges overall. Firstly, the issue of homogenization in innovation paths is quite prominent, as many enterprises tend to imitate industry leaders, which results in a lack of differentiated competitive advantages (Chesbrough, 2010). Secondly, the collaborative mechanism between enterprises is not yet sound, and the ability to co create value is insufficient, especially in terms of data openness and sharing, cross-border collaboration mechanisms, and benefit distribution systems, which have not yet formed mature models, restricting the collaborative efficiency of the ecosystem (Parise et al., 2016). In addition, small and medium-sized enterprises still have shortcomings in digital infrastructure, technological capabilities, and strategic thinking, making it difficult for them to fully integrate into the digital ecosystem network, which limits their ability to innovate business models. Finally, the inability of policies and regulations to keep up with new business models has created uncertainty and gaps for some companies trying to innovate, which impacts the ongoing success and reliability of their innovations (Liu et al., 2023).

At present, some scholars' research on value co creation and business ecosystems starts from the theory of value co creation and the framework of business ecosystems, constructing conceptual models and system theory frameworks to clarify the value flow and co creation path empowered by digital technology. Hein et al. (2019) focused on value co creation practices in B2B platform ecosystems and found that participants in B2B platforms mainly achieve value co creation through resource complementarity, data sharing, and technological collaboration, revealing the dynamic balance mechanism between standardization and heterogeneity in ecological collaboration. From the perspective of dynamic capabilities, Tran and Vu (2021) found through bidirectional survey data

between Vietnamese service enterprises and customers that customer citizenship and participation behaviour have a differentiated impact on the company's customization and service capabilities, which are then transmitted to customers' perceived value. Technological level and relationship marketing orientation play a moderating role in the relationship between customer co creation behaviour and customization capabilities. Struwe and Slepniov (2023) based on the service-orientated logic, analyzed typical cases from multiple industries such as manufacturing, engineering, and found that digital literacy, coordination ability, reflection ability, and coping ability play an important role in promoting value co creation in the context of digital service. The research on business ecosystems and business model innovation mainly focuses on the evolution mechanism of business models and the impact of digital technology embedding. Gregori and Holzmann (2020) found that digital technology can foster sustainable business model development through digital platforms, digital technologies, and digital measurement tools, thereby embedding social and environmental value creation into business models. Climent & Haftor (2021) and Pant et al. (2024) found that the future application forms of digital technology are fundamentally constrained by the systemic limitations of the architecture for enterprise value propositions, operational logic, and profit models, based on the predictive ability of digital technology for data collection and future development. Its development will generate unique predictive advantages for the innovative transformation of enterprise business models in the future.

In summary, there has been some exploration in the current academic community on value co creation and business model innovation. On the one hand, value co creation has diverse implementation paths among different ecological roles, and its impact mechanism on business models presents stages and complexity. Based on the theory of value co creation and the framework of business ecosystems, some scholars have focused on the value flow mechanism and co creation path construction under the empowerment of digital technology and constructed conceptual models and systematic architectures. On the other hand, business model innovation is not a one-time act but a continuous reconstruction and adaptation in the process of digital ecosystems evolution. Scholars' research on business ecosystem and business model innovation mainly starts with the evolution mechanism of business models and the logic of digital embedding. Most of the related research focuses on a specific perspective or static analysis level, and there is still a lack of systematic sorting and theoretical construction of the dynamic interaction relationship between the two in digital driven ecosystems. Therefore, exploring in depth how value co creation dynamically influences the path mechanism of business model innovation in the digital ecosystem is not only a necessary theoretical deepening, but also an urgent practical need.

2. Theoretical Framework and Hypotheses Development

In a digitally driven business ecosystem, the intensity of value co creation is an important indicator for measuring the degree of ecosystem collaboration and innovation potential. Compared with single participatory value co creation, high-intensity value co creation relationships can better stimulate knowledge integration, resource sharing, and innovation collaboration among all parties, thus becoming the core force driving continuous innovation and evolution of business models (Bhatti et al., 2021). The intensity of value co creation not only reflects the tightness of the connection between enterprises and ecosystem members, but also reflects the activity of information flow, knowledge collision, and resource restructuring. This multidimensional interaction provides rich external knowledge input and internal transformation motivation for business model innovation. Firstly, the increase in value co creation intensity significantly accelerates the absorption and restructuring process of heterogeneous knowledge resources by enterprises. In the digital ecosystem, different entities hold their own unique technologies, data, user insights, and market experiences. High frequency and deep level interactions enable these dispersed knowledge fragments to be more effectively integrated and applied (Kazadi et al., 2016). The strong value co creation relationship encourages enterprises to break organizational boundaries, absorb diverse external innovative

elements, form knowledge combinations and recreations, which helps enterprises continuously propose new business logic and value propositions in customer demand identification, product function design, service experience optimization, and other aspects, thereby promoting the systematic reconstruction of business models. Secondly, the intensity of value co creation promotes the reshaping of the dynamic capability system of enterprises by enhancing resource mobility and allocation flexibility. With the deepening of co creation relationships, enterprises can not only quickly access critical resources within the ecosystem, but also continuously improve their ability to perceive opportunities, allocate resources, and recombine business modules in cross subject collaboration (Jaakkola and Hakanen, 2013). Finally, high-intensity value co creation drives enterprises to shift towards multilateral network relationships in collaboration models. In the digital ecosystem, enterprises establish long-term and stable cooperative relationships with multiple parties, forming a new governance system characterized by sharing, co construction, and win-win. This system reduces institutional barriers to cross-border cooperation, improves adaptability and flexibility in the process of business model innovation, and achieves continuous iteration and evolution of business models in key areas such as customer segmentation, value capture, and ecological collaboration (Yin and Zhao, 2024). Therefore, assume the following.

H₁: The intensity of value co creation has a positive impact on business model innovation.

In a digital driven business ecosystem, enterprise digital technology empowerment serves as a key mediating variable that runs through the transmission process of value co creation and business model innovation. The use of digital technology helps businesses work better together to create value and also changes how they combine resources, generate knowledge, and carry out innovations. Firstly, in the process of value co creation, enterprises have reshaped the logical system of resource integration and innovative development by introducing advanced digital technologies. Digital technology serves as a catalyst for resource orchestration, enabling enterprises to more agilely capture changes in customer needs and preferences, thereby achieving precise resource allocation and rapid response (Hurtado Mora et al., 2024). Not only does it improve the efficiency and accuracy of co creation activities, but it also greatly expands the possible space for enterprise business model innovation, promoting continuous iteration and optimization of key elements such as value proposition, channel structure, and revenue model. Secondly, digital technology significantly enhances the information flow and knowledge sharing among all parties involved in the value co creation process. Through digital platforms, intelligent interfaces, and collaborative tools, enterprises can achieve real-time interaction and deep communication with multiple entities, breaking the traditional phenomenon of information silos within organizational boundaries. The improvement of information flow enables enterprises to collect diversified demand signals, technological ideas, and market feedback in a shorter period of time, enhancing the overall efficiency of problem identification, solution generation, and product iteration in the co creation process (Peltier et al., 2020). Thirdly, digital technology empowers the reshaping of cooperation mechanisms and governance structures in the process of value co creation. In the traditional co creation model, participating parties face problems such as asymmetric collaboration, insufficient incentives, and high governance costs. However, using digital technology improves trust and motivation in teamwork by employing smart contracts, algorithm rules, and clear data (Jayasuriya and Sims, 2023). Enterprises use digital platforms to establish a collaborative system based on standardised interfaces and automated processes, which reduces transaction costs for cross-organisational coordination and enhances adaptability to dynamic environmental changes. Therefore, this article proposes the following research hypotheses:

H₂: The empowerment of enterprise digital technology plays a mediating role in the impact of value co creation and business model innovation.

In a digital driven business ecosystem, market competitiveness, as an important reflection of external environmental characteristics, has a significant moderating effect on the path and effect of

value co creation mechanism on business model innovation. Specifically, high-level market competition weakens the positive driving effect of value co creation on business model innovation by affecting resource acquisition costs, collaborative stability, and expected innovation returns. Firstly, from the perspective of willingness to invest resources, in a highly competitive environment, enterprises tend to allocate their own resources more cautiously in the process of value co creation. Due to intensified competition leading to increased market uncertainty, companies tend to conservatively allocate key resources and reduce their deep investment in external co creation activities, thereby reducing their ability to absorb heterogeneous resources and innovative elements in the co creation process. On the contrary, in a less competitive environment, enterprises are more motivated to engage in open collaboration and high-intensity value co creation, thereby unleashing greater potential for business model innovation. Secondly, from the perspective of the stability of collaborative networks, highly competitive environments are often accompanied by higher opportunistic tendencies and fluidity among the internal entities of the ecosystem, leading to a decrease in the stability of value co creation relationships (Kumar and Zaheer, 2019). In highly competitive markets, partners are prone to reduce deep collaboration due to short-term interests, and customer engagement may fluctuate due to diversified brand choices, thereby weakening knowledge sharing, resource integration, and innovation collaboration in the co creation process. This directly affects the sustainability and systematic role of co creation mechanisms in business model innovation, making it difficult for enterprises to achieve deep business model reconstruction and continuous optimization based on value co creation. Thirdly, in highly competitive markets, enterprise innovation is more driven by survival pressure than proactive innovation based on long-term strategic optimisation (Rehman et al., 2023). In this context, value co creation is often used by enterprises as a strategic tool to address short-term competitive threats, rather than as a long-term cooperative path for systematically reshaping business models. In contrast, an environment with less competitive pressure helps companies plan and deepen value co creation activities from a longer-term perspective, thereby more effectively promoting overall changes in business models. Based on this, this article proposes the following research hypotheses:

H₃: In a digital driven business ecosystem, negative market competition moderates the impact of value co creation on business model innovation.

3. Methodology

3.1. Variable selection

(1) The explained variable is business model innovation (*Innovation*). This article mainly measures business model innovation through the Business model innovation index, using Python to extract keywords for business model innovation (Saura et al., 2019).

(2) The explanatory variable is the value co creation model (*Value*). Value co creation is a collaborative process among stakeholders to meet the value needs of each value co creator. This article uses the intensity of value co creation to measure the value co creation model (Ranjan and Read, 2016).

(3) The moderating variable is market competitiveness (*MC*). This article uses the Herfindahl index to measure the market competitiveness of enterprises, according to Rehman (2025).

(4) The mediating variable is digital technology empowerment (*Tech*). Enterprise digital technology empowerment refers to the process in which enterprises utilize emerging digital technologies to comprehensively digitize and upgrade their capabilities, in order to achieve efficiency improvement, innovation breakthroughs, and value reshaping. This article proposes a word frequency inverse text frequency (TF-IDF) method in machine learning to more accurately characterize the digital empowerment situation of Chinese enterprises (Jing et al., 2025). The specific variables are shown in Table 1.

Table 1. Variable Definition

Type of variable	Variable	Symbol	Definition
Explained variable	Business model innovation	<i>Innovation</i>	Business model innovation index
Explanatory variable	Value co creation model	<i>Value</i>	Value creation amount/Year-end total assets
Moderating variable	Market competitiveness	<i>MC</i>	Herfindahl index
Mediating variable	Digital technology empowerment	<i>Tech</i>	TF-IDF method characterization
Control variables	Enterprise size	<i>Size</i>	Logarithmic calculation of total assets
	Property rights	<i>Lev</i>	Total liabilities/Owner's equity
	Return on equity	<i>ROE</i>	After tax profit/Net assets * 100%
	Total Assets Growth Rate	<i>AssetGrowth.</i>	Total asset growth/Total assets:
	Concentration of equity	<i>Top3</i>	The sum of the shareholding ratios of the top three major shareholders of the company
	Listing period	<i>ListAge.</i>	Year of listing - year of listing+1, and take the logarithm

3.2. Model building

To investigate the impact of value co creation models on business model innovation in digital driven business ecosystems, benchmark models (1) were constructed to verify hypothesis H1, model (2) to verify the moderating effect of market competition, and models (1), (3), and (4) to verify the mediating role of digital technology empowerment. The model is as follows:

$$Innovation_{i,t} = \beta_0 + \beta_1 Value_{i,t} + \beta_2 Controls_{i,t} + \varepsilon \quad (1)$$

$$Innovation_{i,t} = \beta_0 + \beta_1 Value_{i,t} + \beta_2 Value \times MC_{i,t} + \beta_3 Controls_{i,t} + \varepsilon \quad (2)$$

$$Tech_{i,t} = \beta_0 + \beta_1 Value_{i,t} + \beta_2 Controls_{i,t} + \varepsilon \quad (3)$$

$$Innovation_{i,t} = \beta_0 + \beta_1 Tech_{i,t} + \beta_2 Tech_{i,t} + \beta_3 Controls_{i,t} + \varepsilon \quad (4)$$

Among them, $Innovation_{i,t}$ represents business model innovation, $Value_{i,t}$ represents value co creation model, $MC_{i,t}$ represents market competitiveness, $Tech_{i,t}$ represents digital technology empowerment, $Controls_{i,t}$ is the control variables, and ε represents the random error term.

3.3. Data sources

The research object selected in this article is Chinese A-share listed companies, which obtain financial data from public databases such as Wind and CSMAR. To ensure the accuracy and reliability of the results, this article obtained a total of 22479 observation data after removing missing values and abnormal data samples.

4. Empirical Analysis

4.1. Descriptive statistics

Descriptive statistical analysis was conducted on the relevant variables involved. From Table 2, it can be seen that the mean of *Innovation* is 0.017, the standard deviation is 0.022, the minimum value is 0.000, and the maximum value is 0.275, indicating that the overall level of investment or performance of enterprises in business model innovation is relatively low, but there are significant differences between enterprises. The mean value of the *Value* is 0.112, the standard deviation is 0.088, the minimum value is -0.241, and the maximum value is 0.403, indicating that the degree of

application of the value co creation model varies among enterprises. Some enterprises may not have effectively carried out value co creation, while others have achieved good results. Table 2 displays the other control variables.

Table 2. Descriptive statistics

VARIABLES	N	Mean	SD	Median	Min	Max
<i>Innovation</i>	22517	0.017	0.022	0.010	0.000	0.275
<i>Value</i>	22517	0.112	0.088	0.106	-0.241	0.403
<i>Size</i>	22517	22.576	1.345	22.388	19.478	26.452
<i>Lev</i>	22517	0.462	0.199	0.461	0.049	0.934
<i>ROE</i>	22516	0.036	0.179	0.060	-2.175	0.418
<i>AssetGrowth</i>	22480	0.149	0.375	0.074	-0.417	5.595
<i>Top3</i>	22517	0.477	0.156	0.468	0.150	0.864
<i>ListAge</i>	22517	2.268	0.802	2.398	0.000	3.434

4.2. Analysis of the benchmark regression results

This article uses the OLS regression model to explore the impact of value co creation model on business model innovation, and Table 3 shows the results of the benchmark regression model. The regression coefficient of *Value* was found to be 0.0512, significant at the 1% level, indicating that the higher the proportion of value co creation, the higher the level of the business model innovation index, and H₁ was validated. The possible reason is that in a digital driven business ecosystem, the higher the degree of co creation of enterprise value, the deeper the co creation of value promotes the full sharing of knowledge and experience between enterprises and partners, and the closer the cooperation between enterprises and stakeholders, which can integrate diverse resources and creativity and provide support for business model innovation. Moreover, under high-value co creation, all parties collaborate to explore new market opportunities, jointly tackle challenges, and drive enterprises to continuously try and optimize their business models.

Table 3. Benchmark regression results

VARIABLES	<i>Innovation I</i>
<i>Value</i>	0.0512*** (24.143)
<i>Size</i>	0.00243*** (17.657)
<i>Lev</i>	-0.0124*** (-14.339)
<i>ROE</i>	-0.0239*** (-22.577)
<i>AssetGrowth</i>	-0.000350 (-0.893)
<i>Top3</i>	-0.0258*** (-25.908)
<i>ListAge</i>	-0.00414*** (-19.751)
Constant	-0.0153*** (-5.586)
N	22,479
R-squared	0.076
Year FE	YES
Id FE	YES

t-statistics in parentheses: *** p<0.01, ** p<0.05, * p<0.1 (The same below)

4.3. Robustness test

In order to verify the robustness of the research results, this article uses the business model innovation coefficient measured by factor analysis to replace the explained variable (*Innovation I*). Table 4 (1) lists the regression results after replacing the dependent variable, indicating that the positive impact of value co creation mode on business model innovation is still significant. The results

are consistent with the hypothesis H1 in the benchmark regression analysis, indicating the robustness of the empirical conclusions in this paper.

Table 4. The robustness test

VARIABLES	<i>Innovation</i> ₁
<i>Value</i>	0.781*** (21.842)
<i>Size</i>	0.00488** (2.102)
<i>Lev</i>	-0.823*** (-56.185)
<i>ROE</i>	-0.0575*** (-3.211)
<i>AssetGrowth</i>	-0.000571 (-0.086)
<i>Top3</i>	0.0916*** (5.444)
<i>ListAge</i>	-0.00825** (-2.332)
<i>Constant</i>	0.0774* (1.675)
<i>N</i>	22,479
<i>R-squared</i>	0.220
<i>Year FE</i>	YES
<i>Id FE</i>	YES

4.4. Heterogeneity analysis

4.4.1. Heterogeneity testing of different enterprise sizes

Firstly, group regression analysis was conducted on enterprises of different sizes, and Table 5 shows the regression results for large-scale and small-scale enterprises, respectively. From columns (1) and (2), it can be seen that regardless of the size of the enterprise, the impact of *Value* on *Innovation* is positively significant at the 1% significance level, but the coefficient for large-scale enterprises (0.0522) is slightly higher than that for small-scale enterprises (0.0492). In a digital driven business ecosystem, the common logic and differentiated paths of value co creation driven business model innovation among enterprises of different scales complement each other. Large-scale enterprises rely on cutting-edge technologies to build full chain digital capabilities, leading the integration of ecological standards and resources, and driving systematic innovation with high investment, but are constrained by organizational collaboration costs. Small-scale enterprises utilise digital platforms to achieve deep cultivation and agile iteration in lightweight scenarios, leveraging local breakthroughs that respond to low-cost demands, but they are limited by their capacity to manage risks.

Table 5. Heterogeneity tests at different scales

VARIABLES	(1)	(2)
	Large-scale enterprises	Small-scale enterprises
	<i>Innovation</i>	<i>Innovation</i>
<i>Value</i>	0.0522*** (18.218)	0.0492*** (15.207)
<i>Size</i>	0.00187*** (4.989)	0.00212*** (9.596)
<i>Lev</i>	-0.0106*** (-8.559)	-0.0146*** (-11.756)
<i>ROE</i>	-0.0266*** (-17.942)	-0.0201*** (-13.118)
<i>AssetGrowth</i>	-0.00109* (-1.729)	0.000174 (0.353)
<i>Top3</i>	-0.0269*** (-16.807)	-0.0254*** (-19.891)
<i>ListAge</i>	-0.00490***	-0.00347***

VARIABLES	(1)	(2)
	Large-scale enterprises <i>Innovation</i>	Small-scale enterprises <i>Innovation</i>
Constant	(-16.501) -0.00212	(-11.295) -0.00859*
N	(-0.268) 11,172	(-1.785) 11,307
R-squared	0.076	0.077
Year FE	YES	YES
Id FE	YES	YES

4.4.2. Heterogeneity testing in different regions

Further grouped regression analysis was conducted on households in the eastern, central, and western regions, and Table 6 shows the regression results for different regions. In various regions, the impact of *Value* on *Innovation* shows a significant positive promotion effect, but the coefficient indicates a gradient difference of high in the east and low in the central and western regions, which is rooted in the structural differentiation of regional resource endowment and digital ecological maturity. The eastern region relies on its economic vitality, technological infrastructure, and advantages in gathering high-end talents to deeply integrate digital technology and drive the iteration of high value-added business models. However, the central and western regions are limited by the level of industrial digitization, talent outflow, and capital siphon effects, and value co creation relies more on policy guided industrial clusters or platform economy spillovers. Although traditional business efficiency is improved through low-cost digital tools, business model innovation still focuses on optimizing the value chain of existing industries due to the lack of breakthroughs in underlying technology and ecological dominance, resulting in weaker marginal innovation effects of value co creation compared to the eastern region, forming regional innovation level differentiation.

Table 6. Heterogeneity test in different regions

VARIABLES	(1)	(2)	(3)
	Eastern region <i>Innovation</i>	Central region <i>Innovation</i>	Western region <i>Innovation</i>
<i>Value</i>	0.0604*** (22.973)	0.0221*** (4.763)	0.0224*** (4.717)
<i>Size</i>	0.00291*** (16.620)	0.00174*** (6.040)	0.000339 (1.202)
<i>Lev</i>	-0.0143*** (-12.850)	-0.0114*** (-6.509)	-0.00229 (-1.292)
<i>ROE</i>	-0.0293*** (-21.365)	-0.0103*** (-4.931)	-0.00928*** (-4.385)
<i>AssetGrowth</i>	-0.000644 (-1.290)	0.000634 (0.829)	0.000525 (0.621)
<i>Top3</i>	-0.0294*** (-23.075)	-0.0222*** (-11.175)	-0.00889*** (-4.275)
<i>ListAge</i>	-0.00394*** (-14.563)	-0.00312*** (-7.280)	-0.00319*** (-7.131)
Constant	-0.0237*** (-6.835)	-0.00491 (-0.857)	0.0163*** (2.833)
N	15,848	3,604	3,011
R-squared	0.084	0.058	0.031
Year FE	YES	YES	YES
Id FE	YES	YES	YES

4.5 Analysis of Impact Mechanism

4.5.1. Mediation effect

According to the model design, this article verifies the existence of the intermediary role of enterprise digital empowerment through three steps. As shown in column (2) of Table 7, *Value* has a significant positive impact on *Tech*. Secondly, as shown in column (3) of Table 7, both *Value* and *Tech*

have a positive promoting effect on *Innovation*, indicating that *Tech* plays a mediating role. Perhaps it is because value co creation, through the interaction of diverse subjects' data and the sharing of technological modules, forces enterprises to break through traditional capability boundaries, integrate digital technology to achieve data assetization and process agility, reconstruct the logic of value creation, and rely on organizational platformization and decision-making intelligence to improve the response speed of business model innovation. Therefore, H₂ is validated.

Table 7. Mechanism of Mediating Effect Influence

VARIABLES	(1) <i>Value</i>	(2) <i>Innovation</i>
<i>Value</i>		0.0190*** (14.157)
<i>Tech</i>	11.83*** (19.500)	22.91*** (186.528)
<i>Size</i>	-0.00593*** (-13.844)	0.00157*** (18.154)
<i>Lev</i>	-0.0420*** (-15.515)	-0.00352*** (-6.442)
<i>ROE</i>	0.292*** (107.690)	-0.00890*** (-13.290)
<i>AssetGrowth</i>	0.00374*** (3.056)	-0.00107*** (-4.370)
<i>Top3</i>	0.0348*** (11.086)	-0.00728*** (-11.511)
<i>ListAge</i>	-0.00305*** (-4.643)	-0.00205*** (-15.513)
Constant	0.240*** (28.651)	-0.0192*** (-11.185)
N	22,479	22,479
R-squared	0.423	0.637
Year FE	YES	YES
Id FE	YES	YES

4.5.2. Moderating effect

This article further introduces market competitiveness (*MC*) as a moderating variable. As shown in column (1) of Table 8, the coefficient of the interaction term *Value* × *MC* is significantly negative, indicating that an increase in market competition can reduce the positive impact of *Value* on *Innovation*, verifying H₃. This may be because market competition pressure forces enterprise resource allocation strategies to shift towards short-term survival games, thereby inhibiting the long-term ecological investment and collaboration depth required for value co creation. Meanwhile, when a company achieves a breakthrough in its business model through value co creation, competitors can quickly erode the innovation dividend through plagiarism or low price strategies, forcing the company to reduce innovation investment to avoid risks, ultimately weakening the leverage effect of value co creation on business model innovation.

Table 8. Analysis of the impact mechanism of regulatory effects

VARIABLES	(1)	(2)
	<i>Innovation</i>	<i>Innovation</i>
<i>Value</i>	0.0512*** (24.034)	0.0543*** (19.512)
<i>MC</i>	0.00722*** (8.620)	0.00897*** (6.854)
<i>Value</i> × <i>MC</i>		-0.0149* (-1.738)
<i>Size</i>	0.00241*** (17.439)	0.00241*** (17.457)
<i>Lev</i>	-0.0125*** (-14.351)	-0.0125*** (-14.330)
<i>ROE</i>	-0.0237*** (-22.301)	-0.0237*** (-22.301)
<i>AssetGrowth</i>	-0.000377 (-0.954)	-0.000373 (-0.944)
<i>Top3</i>	-0.0262*** (-26.149)	-0.0262*** (-26.141)
<i>ListAge</i>	-0.00415*** (-19.699)	-0.00415*** (-19.703)
<i>Constant</i>	-0.0160*** (-5.827)	-0.0164*** (-5.961)
N	22,358	22,358
R-squared	0.079	0.079
Year FE	YES	YES
Id FE	YES	YES

5. Conclusion

This article empirically studies the value co creation model and business model innovation in a digital driven business ecosystem, revealing the significant impact of value co creation model and business model innovation. Research has shown that as the degree of value co creation increases, the innovation coefficient of business models also significantly increases. The value co creation model has a promoting effect on business model innovation. In further influencing mechanisms, through the introduction of digital technology empowerment variables, it was found that the enterprise value co creation model can enhance the degree of digital technology empowerment, thereby promoting enterprise business model innovation. Meanwhile, the higher the market competition, the weaker the positive impact of value co creation and business model innovation. The significant negative adjustment of market competitiveness moderates the relationship between value co creation models and business model innovation. In addition, heterogeneity analysis found that the positive effect of value co creation model on business model innovation is most significant in large-scale enterprises and the eastern region. From this, it can be seen that digital technology has lowered the threshold for participation in value co creation, enabling enterprises of different scales to achieve business model innovation through data-driven, technology empowered, and ecological collaboration. In the future, the popularization of digital technology will accelerate the innovation efficiency transition of small-scale enterprises, while large-scale enterprises need to turn to open ecology and small and micro symbiosis to jointly promote the dynamic reconstruction of business models and the fission of value networks. In order to verify the robustness of the conclusions in this article, we chose to replace the dependent variable and change the sample to conduct robustness tests on the main conclusions, and found that the empirical research conclusions have good robustness.

6. Recommendation

Based on the empirical research results of this article, in order to further promote the virtuous cycle of value co creation and business model innovation in the digital driven business ecosystem, the following policy suggestions are proposed in this article:

6.1. Strengthen the construction of value co creation intensity within the ecosystem and stimulate the innovation vitality of business models

Firstly, it is necessary to strengthen interactive incentives. The government sets up special funds to support enterprises in building innovation platforms and co creation communities, and introduces incentive policies to encourage joint development and other co creation models, in order to enhance the quality of value co creation. Secondly, it is necessary to build a solid foundation of trust, establish standards, improve intellectual property protection and data sharing agreements, reduce cooperation risks, and enhance the stability of co creation relationships. Finally, we need to promote the transformation of the model by providing government funding to build a digital innovation platform, attracting diverse stakeholders to participate, constructing an open innovation network, upgrading the co creation model, and providing diversified support for business model innovation.

6.2. Accelerate the process of empowering enterprise digital technology and solidify the technological foundation for business model innovation

On the supply side, the government will increase investment in key digital technologies, promote technology popularization, and use industry alliances to lower the entry barriers for small and medium-sized enterprises. On the demand side, policies guide enterprises to attach importance to digital empowerment, promote the full process digital transformation of enterprises through tax incentives, support the development of co creation tools, and promote information and knowledge sharing and co creation upgrading. In addition, optimizing the digital governance environment, improving regulatory standards such as data security, regulating the application of smart contracts, enhancing enterprise trust, reducing costs, and ensuring sustainable development of business model innovation.

6.3. Reasonably regulate market competition, mitigate negative regulatory effects, and optimize the innovation ecological environment

On the one hand, strengthen anti-monopoly supervision in key and emerging fields, curb oligopoly and vicious price competition, maintain market fairness and diversity, and create an ecological space for value co creation and business model innovation. On the other hand, multiple measures should be taken to reduce the cost of resource acquisition and collaborative uncertainty in a highly competitive environment for enterprises. Establish industry public resource pools, provide standardized research and development facilities and other basic support, and help enterprises, especially small and medium-sized enterprises, obtain key resources; Encourage cross-border cooperation projects, build cross industry collaboration bridges, break down barriers, improve resource integration efficiency and co creation network stability.

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