

Is entrepreneurial innovation the intermediary variable?

Empirical research on the relationship between policy perception and enterprise collaborative innovation performance

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Abstract: A hundred years ago, the economist Charles Schumpeter first defined innovation as an unprecedented new combination of factors of production. In today's "mass innovation", the enterprise innovation environment is excellent and the potential is huge. The entrepreneurial innovation spirit is the "baton" to achieve the new combination. However, can entrepreneurial innovation become an intermediary mechanism between innovation policy perception and collaborative innovation performance by weighing internal and external resources? In this paper, we construct a mediation model based on structural equations. The results show that the entrepreneurial innovation spirit plays an intermediary role between the supply-based and environment-based innovation policy perception and the enterprise collaborative innovation performance. In the relationship between demand-based innovation policy perception and innovation performance, entrepreneurial innovation spirit also only plays a partial intermediary role, but the indirect effect of demand-based innovation policy perception on collaborative performance is significant and not significant, and the variable of entrepreneurial innovation spirit becomes completely intermediary at this time.

Key words: entrepreneurship spirit; innovation policy; intermediary effect; collaborative innovation performance

Introduction

General Secretary Xi has pointed out that "market vitality comes from people, especially from entrepreneurs, and from entrepreneurship." In the era of knowledge economy, the cultural characteristics of China's economy are also increasingly significant, especially the spiritual culture and other intellectual factors have shown unprecedented huge social value. Entrepreneurship is essentially a deep-seated organizational cultural value, and its core and soul is the spirit of innovation. Industry will decline, and innovation is expected. We must encourage the innovation spirit of entrepreneurs to grow and revitalize traditional ones.

This paper proposes the proposition that the entrepreneurial innovation spirit has an important intermediary transition nature. On the one hand, confirming the intermediary role of entrepreneurial innovation spirit is helpful to clarifying the necessity of carrying forward the entrepreneurial innovation spirit, which is the logical premise and due meaning of further analyzing and discussing the cultivation of entrepreneurial innovation spirit and even putting forward suggestions on innovation policies and systems. Entrepreneurial innovation, on the other hand, as a bridge and link, in the enterprise and regional economic development status, role is irreplaceable, but the domestic research on the intermediary effect of entrepreneurship is mostly confined to the enterprise internal perspective, ignoring the key role in the government in the innovation "rules of the game", so clarify the relationship between "policy-spirit-performance" intermediate mechanism has certain research value.

1. Theoretical basis and research assumptions

1.1 Innovation policy perception and entrepreneurial innovation spirit

Hambrick & Mason (1984) believes that the choice of enterprise strategy is the senior managers of the situation is highly personalized interpretation, entrepreneurs and managers in the policy environment and spiritual strategy has strong subjective initiative, through the entrepreneurial strategy under the cognitive framework of specific policy environment, decision-making and adaptation. The experience, personality, values, and other characteristics of entrepreneurs and executives are heavily injected into their corresponding management behaviors. Different decision-makers have different cognitive structures and generate different interpretations of the same environment, which can lead to different strategic responses, which can well explain why enterprises with the same policy support conditions for innovation perform very differently in real life. In fact, it is not that the system itself directly affects the strategy, but through the perception of entrepreneurs, especially the understanding and cognition of the relevant policies and systems related to the vital interests and competitive advantages of enterprises. Therefore, it can be considered that the corresponding strategic choice of enterprises is the result of the institutional environment and entrepreneurial spirit factors. Accordingly, the assumptions are proposed as follows:

Hg: The perception of supply-based innovation policy has a direct and significant positive impact on the entrepreneurial innovation spirit

Hh: Demand-based innovation policy perception has a direct

and significant positive impact on the entrepreneurial innovation spirit

Hi: The perception of environmental innovation policy has a direct and significant positive impact on the entrepreneurial innovation spirit

1.2 Innovation policy perception and collaborative innovation performance

Considering the system as the main independent variable is an important view represented by the institutional school. In emerging economies, the strategy and performance of domestic and foreign companies will be significantly determined by formal and informal constraints. Among them, the connotation of the system support refers to the relevant government departments can provide what degree of support, and reduce the formal system in the process of economic transformation of imperfect adverse effects on enterprises, mainly including the government and related departments to provide enterprises with the required information, technology, research and development subsidies, tax breaks, license certification and other support. Institutional support and policy support can not only enable enterprises to obtain scarce strategic resources, but also mean the mastery of the rules to some extent. On the one hand, the official support can reduce the operational risks and uncertainties, and improve the competitive efficiency of enterprises in the market. On the other hand, enterprises can expand the strategic choice space and enhance their competitive advantage. Accordingly, the assumptions are proposed as follows:

Ha: Supply-based innovation policy perception has a direct and significant positive impact on innovation performance

Hb: Supply-based innovation policy perception has a direct and significant positive impact on collaborative performance

Hc: Demand-based innovation policy perception has a direct and significant positive impact on innovation performance

Hd: Demand-based innovation policy perception has a direct and significant positive impact on collaborative performance

He: Environmental innovation policy perception has a direct and significant positive impact on innovation performance

Hf: Environmental innovation policy perception has a direct and significant positive impact on collaborative performance

1.3 Results of entrepreneurial Innovation Spirit——collaborative innovation performance

Comprehensive individual and the connotation of company entrepreneurship, and combined with high wave (2007) and han dong (2008), the definition of entrepreneurial innovation is as follows: entrepreneurial innovation spirit is innovative characteristics of enterprise managers at all levels have strong innovation desire, motivation and intention, strategic vision, have the courage to forge ahead old new. Its specific components include: the entrepreneur's innovative consciousness concept and innovative personality characteristics. Among them, the value orientation and creative thinking covered by the innovation consciousness concept are the premise and motivation of the entrepreneurial innovative spirit, and the innovation preference and knowledge literacy contained in the innovative personality characteristics are the summary and guarantee of the entrepreneurial innovative spirit.

Innovation is the essence of entrepreneurship, and entrepreneurship is the tool and process to realize innovation. The entrepreneurial innovation spirit with the goal of realizing product or business innovation is inevitably related to the overall

performance level of the enterprise. More and more research results have supported that the entrepreneurial innovation spirit is an important leading variable of the enterprise performance level, and the entrepreneurial innovation spirit can play a positive role in promoting the enterprise performance level. Yu Xiaoyu and CAI Li (2013) conducted research on enterprise innovation performance based on both innovation speed and innovation quality. In terms of innovation speed, Shan et al. (2016) empirically found that the innovation of entrepreneurship does help to improve the speed of innovation. In terms of innovation quality, Gunday et al. (2011) believes that the entrepreneurial innovation spirit runs through the production and operation activities to improve the quality of products and services and reduce production costs to improve the innovation performance: strategic synergy, knowledge collaboration, organization collaboration and deep network collaboration proposed by Sun Shanlin (2017). Gao Hui (2017) pointed out in his doctoral thesis that the entrepreneurial innovation spirit is conducive to cultivating the corporate innovation culture and atmosphere, which can not only improve the creativity of the enterprise employees, but also ensure the innovation and entrepreneurship activities to obtain sufficient resource support, which lays a strategic and organizational foundation for realizing the cooperation between government, industry, university and research. Gunawan et al. (2016) further pointed out that the entrepreneurial innovation spirit can realize the deep coordination between government, industry, university and research institutes under the innovation network, and can also strengthen the knowledge collaboration between government, industry, university and research institutes. To sum up, it can be considered that the entrepreneurial innovation spirit can greatly improve the effect of enterprise operation. Accordingly, the following assumptions are made:

Hj: Entrepreneurial innovation spirit has a direct and significant positive impact on innovation performance

Hk: Entrepreneurial innovation has a direct and significant positive impact on collaborative performance

1.4 The intermediary role of entrepreneurial innovation spirit

The spirit of entrepreneurial innovation has become a bridge between the employees of the government authority and the enterprise who directly creates value, and plays a key role in connecting the preceding and the future. Policy system is an important reason for the role of entrepreneurial innovation spirit. Innovation performance is the inevitable result of the role of entrepreneurial innovation spirit. It is generally believed that government policy determines the performance of enterprise innovation performance, and the intermediary effect of entrepreneurial innovation spirit is obvious. To sum up, innovation policy is the fundamental factor for the improvement of enterprise innovation performance, and entrepreneurial innovation spirit is the direct driving source of innovation performance, which both play a decisive role in the quality level of enterprise innovation performance.

Combined with the further discussion of Sun Zao and Xue Xiaogang (2008) on the so-called "Chandler proposition" in industrial organization theory and enterprise theory, this paper conducts the specific discussion on the intermediary role of entrepreneurial innovation spirit through the research paradigm of "environmental strategy performance". It is not difficult to

see that the innovation of entrepreneurship spirit is not only a personal strategic vision, but also a strategic orientation pursued by the whole enterprise, which has both the characteristics of personal entrepreneurship spirit and corporate entrepreneurship spirit strategy. In the theory of strategic management, some scholars believe that the environment, strategy and performance form an intermediary model, that is, the so-called environmental determinism or institutional basic view. Exbiotic environmental variables such as policy and system are taken as the independent variable, and the behavior choice of entrepreneurs is taken as the intermediary transmission to determine the enterprise innovation and entrepreneurship strategy, and finally the actual innovation results are determined by the dependent variable of enterprise innovation performance. A large number of existing theoretical or empirical research results can support this view. Yao Yongyi and Liu Zhongming (2008) believe that, in essence, the entrepreneurial innovation spirit strategy is a dynamic resource accumulation, transformation, allocation and utilization mechanism, and it is an intermediary mechanism between the external environment, resources and the unique competitive advantages of enterprises. Gao Hui (2017) pointed out in his doctoral thesis that the policy arrangements that emphasize rules and regulations can glow the entrepreneurial spirit of innovation and thus actively affect the innovation performance. Therefore, entrepreneurial innovation is the key balance between the complex policy environment and the characteristics of enterprises themselves. To sum up, in a certain sense, innovation policy perception is highly likely to act on the performance of enterprise collaborative innovation through the entrepreneurial innovation spirit, the dynamic resource allocation mode. Accordingly, the assumptions are presented as follows.

H11: Entrepreneurial innovation spirit has an intermediary effect between supply-based innovation policy perception and innovation performance

H12: Entrepreneurial innovation spirit has an intermediary effect between supply-based innovation policy perception and collaborative performance

H21: Entrepreneurial innovation spirit has an intermediary effect between the demand-based innovation policy perception and the innovation performance

H22: Entrepreneurial innovation spirit has an intermediary effect between demand-based innovation policy perception and collaborative performance

H31: Entrepreneurial innovation spirit has an intermediary effect between environmental innovation policy perception and innovation performance

H32: Entrepreneurial innovation spirit has an intermediary effect between environmental innovation policy perception and collaborative performance

2. Data and study design

2.1 Data collection and sample characteristics

In terms of data collection, we randomly distributed questionnaires to financial centers, high-tech industrial parks and MBA alumni associations and carried out online questionnaire survey, studying 26 identification items such as basic information of enterprises, and a total of 771 valid questionnaires were obtained. The questionnaire information feedback came from 31 provinces and autonomous regions. The survey questionnaire was

all distributed to business owners and enterprise managers. The vast majority of the respondents were middle and senior managers (including business owners) in various industries.

2.2 Variable measurement and reliability validity analysis — intrinsic quality assessment

All the measurement items used as the observation variable in this study were adapted from the Chinese and Western Maturation Scale, and were widely validated by the domestic and foreign literature, and the questionnaire used the Likert Level 7 scale. Variables' correspondence and structural models are shown in the table below.

Table 1 corresponds to the model variables

latent variable	Observational variables
Supply type innovate policy perception(X1))	PSP1、PSP2:information disclosure
	PSP3:Financial tilt
	PSP4:Personnel cooperation
Demand type innovate policy perception(X2)	PDP1: Promotion
	PDP2: Standard formulation
	PDP3: Government procurement
	PDP4: Market development
environmental forms innovate policy perception(X3)	PEP1: Convenience of regulations
	PEP2: Tax breaks
	PEP3: Market regulation
	PEP4: Property rights protection
entrepreneur creative spirit(Z)	EIS1, EIS2, EIS3: innovative consciousness concept
	EIS4, EIS5, EIS6: Innovative personality traits
Innovative performance(Y1)	IP1, IP2: Innovation speed
	IP3, IP4: Innovation quality
Collaborative performance(Y2)	SP1: Strategic synergy
	SP2: Knowledge collaboration
	SP3: Organizational collaboration
	SP4: Multi-agent network deep collaboration

Combined with the construction idea and variable design of Figure 1, the basic form of the model is set as follows:

$$\begin{cases} Z = a_1 X_1 + a_2 X_2 + a_3 X_3 + i_1 \\ Y_1 = a_1 X_1 + a_2 X_2 + a_3 X_3 + b_1 Z + i_2 \\ Y_2 = a_3 X_1 + a_3 X_2 + a_3 X_3 + b_2 Z + i_3 \end{cases}$$

If η ($i=1,2,3$) represents the endogenous potential variables of the model, respectively, which are the entrepreneurial innovation spirit, innovation performance and collaborative performance; ξ_j ($j=1,2,3$) represents the exogenous potential variables of the model, respectively, which are supply innovation policy perception, demand innovation policy perception and environmental innovation policy perception, the structural equation can be written accordingly:

$$\eta = B\eta + \Gamma\xi + \zeta$$

among,

$$\eta = \begin{bmatrix} Z \\ Y_1 \\ Y_2 \end{bmatrix} \quad B = \begin{bmatrix} 0 & 0 & 0 \\ b_1 & 0 & 0 \\ b_2 & 0 & 0 \end{bmatrix} \quad \Gamma = \begin{bmatrix} a_1 & a_2 & a_3 \\ a_1 & a_2 & a_3 \\ a_3 & a_3 & a_3 \end{bmatrix}$$

$$\xi = \begin{bmatrix} X_1 \\ X_2 \\ X_3 \end{bmatrix} \quad \zeta = \begin{bmatrix} i_1 \\ i_2 \\ i_3 \end{bmatrix}$$

Yi Danhui (2008) pointed out that the idea of solving the structural equation model is to minimize the difference between the sample covariance matrix and the preset model covariance matrix. The reliability and validity analysis for models or variables was mainly completed through the reliability test, validity test and validation factor analysis (CFA) respectively through SPSS and AMOS analysis software, and the evaluation results of the internal quality of the model were generally good.(1) In the measurement model, all the non-standardized factor load λ passed the significance test, that is, the significance probability of $p < 0.001$ was satisfied and $|t| > 3.29$, and the measurement error e_0 was significant. The vast majority of the standardized factor load λ is between 0.65 and 0.8, and the multivariate correlation square SMC satisfies:, so the observed variables can be well explained by the latent variables.(2) Reliability, mainly explaining the consistency and stability of data results, reflecting the problem of "unreliable". As shown in Table 3, the overall Cronbach's α of the scale is 0.807, and the Cronbach's α value of the configuration surface of each latent variable is greater than 0.7, while the combined reliability is greater than 0.7. Therefore, the internal consistency of the model and the variables is very ideal and has quite high credibility.(3) Validity refers to the degree of effectively measuring the characteristics of the survey respondents, reflecting the question of "accuracy". In terms of structural validity, as shown in Table 2, on the one hand, the convergent validity of each latent variable is good, and the average variance extraction AVE of the configuration surface of each latent variable is in a reasonable range of 0.36-0.6. On the other hand, the discriminant validity of the latent variables is also good, and the positive square root of the average variance extracted amount AVE of each latent variable is greater than the correlation coefficient between the other latent variables, that is, the variable meets the conditions:. Thus, the latent variable validity achieves a unity of homogeneity and heterogeneity. The results are summarized as follows:

Table 2 Descriptive statistics, reliability values, mean variance extraction quantities, and their correlation coefficient matrices of the latent variables

latent variable	α	CR	AVE	PSP	PDP	PEP	EIS	IP	SP
PSP	0.742	0.746	0.427	0.653					
PDP	0.711	0.715	0.385	-0.090	0.620				
PEP	0.815	0.816	0.527	-0.071	-0.037	0.725			
EIS	0.790	0.802	0.408	0.167***	0.271***	0.161***	0.638		
IP	0.847	0.847	0.580	0.208***	0.182***	0.188***	0.313***	0.761	
SP	0.838	0.838	0.565	0.154***	0.143**	0.115**	0.298***	0.588***	0.751
Mean value				5.607	5.557	5.350	5.602	5.419	5.501
Standard deviation				1.261	1.294	1.396	1.246	1.276	1.225

Note: Table N=771, two-tailed test, ** for $p < 0.01$, *** for $p < 0.001$; the value on the diagonal (underlined part) represents the positive square root of the AVE, below the diagonal is the correlation coefficient between the structures.

3. Strategy selection and study results

3.1 Methods and strategies

In this paper, the structure equation model (SEM) in multivariate statistical analysis theory. In the evaluation of the overall adaptation effect of the model, the principle of fit index selection should be adhered to is as follows: grasp the key in the pluralism, and obtain the majority according to the theory. First,

grasp the key. There are many indicators to check whether the theoretical model and the observation data are fit, and the evaluation results of different fit indicators are different. At least the χ^2 / df , CFI, GFI, SRMR, and RMSEA values shall be provided; second, consider the whole. Most scholars believe that the degree of fit between the theoretical model and the observed data should meet the meaning of "most index values meet the standard". At the same time, all kinds of indicators can only represent a part of the overall adaptation degree of the model, so the "majority decision" method may be inconsistent, and does not guarantee that the conclusion can meet the theoretical assumptions, and try to avoid falling into the confusion guided by data; third, emphasize the theory. In the process of modeling the structural equations, not only the model construction should have theoretical guidance and empirical support, but also the choice of fitting indicators. On the basis of theoretical construction and empirical reference, the most relevant and meaningful indicators are further selected to grasp the various measurement characteristics of the model as much as possible. SEM analysis itself is an integrated and complex system, which requires both subjective intervention and rational integration. The final result is not necessarily to propose a highly suitable theoretical model, but to explore the rationality and appropriateness of the preset model constructed according to the theory. Therefore, the goodness of fit cannot be the only basis and does not necessarily pursue its best.

In the selection of mediation effect test method, Bootstrap technology, namely data self-sampling method, is used. Generally speaking, when the number of self-sampling reaches more than 1000 times, the test effect will be more ideal. The statistical test of intermediary variables mainly adopts the confidence interval method based on self-sampling technology, as developed by Mackinnon et al (2004). The traditional mediation effect test method is simply a Z test under a large sample, and the 1.96 critical value does not necessarily mean significant in practice. Therefore, unless the traditional method is more suitable for the mediation effect test of a certain hypothesis model, the Bootstrap measurement results should be adopted. At the same time, it is often possible that the data meets the skewed score, and the Z test is based on the statistical inference of standard normality. If the data is not identified and processed and the Z statistic is constructed, it loses the statistical scientific rigor.

3.2 Descriptive statistical analysis

The research shows that both supply, demand or environmental innovation policy scores are above 5 points, indicating that the government's innovation policy support for information, capital and human resources is deeply popular; the mean of entrepreneurial innovation is 5.602, indicating that the entrepreneurial innovation performs well in the research enterprise, innovation consciousness, confidence and achievement; the average score of enterprise innovation performance is lower, but the standard deviation is higher than the collaborative performance. It shows that the enterprise is active in the cooperation between government, industry, university and research, and the respondents more recognize the achievements of the enterprise in the main body cooperation. However, the average score of innovation performance has still reached 5.419, indicating that the actual innovation performance of enterprises is still ideal, driven by the spirit of innovation.

3.3 Model fitting analysis for——extrinsic quality assessment

According to the research design of this paper, the model

parameters to be estimated are less than the number of variance and covariance, that is, the satisfied unknown number is less than the number of corresponding equations, and the model can be identified. In fact, the fitting index mainly evaluates the model in two ways. On the one hand, the model that actually requires the sample to meet has the highest similarity to the theoretical preset model. On the other hand, the model that requires the sample to actually meet is the least different from the theoretical preset model. In conclusion, the model fitting test in this paper is as follows:

The absolute fit index, mainly derived from the proportion or degree of how much the sample covariance matrix can be explained by the preset model covariance matrix. Specification $NC = \chi^2 / df = 2.082$, completely in the ideal interval of (1,3); goodness $GFI = 0.94609$, modified $AGFI = 0.93409$; normalized residual square $SRMR = 0.059006$; progressive residual square $RMSEA = 0.037005$ and falls within 90% confidence interval and the upper limit is also below 0.05.

The value-added fit index is used to compare the degree of relative improvement between the assumption model and the worst-fit independent model. The comparison fitting index $CFI = 0.951095$ is ideal; non-gauge fitting index $TLI (NNFI) = 0.94409$; gauge fitting index $NFI = 0.91109$ is also in a reasonably acceptable interval. The value-added fitting index $IFI = 0.952095$ was ideal.

Among other indicators, the model parsimony fit indexes $PGFI$, $PNFI$, and $PCFI$ are all greater than the critical value of 0.5, indicating that the model realizes the unification of adaptation and reduction. At the same time, its critical sample number $Hoelter's$ Critical N (i. e., CN value) = 423,200 at a 95% confidence level, indicating that the number of samples for a suitable model is sufficient and the model is in good condition.

3.4 hypothesis test

3.4.1 General hypothesis test

The path coefficient of supply-based innovation policy perception on innovation performance, collaborative performance and entrepreneurial innovation spirit variables is significant. C.R. is greater than 1.96 cutoff, so H_a , H_b and H_g are established; demand-based innovation policy perception on innovation performance, collaborative performance and entrepreneurial innovation spirit variables are significant, and C.R. is greater than 1.96 cutoff, so H_c , H_d and H_h are established successively. The path coefficient of environmental innovation policy perception on innovation performance, collaborative performance and entrepreneurial innovation spirit variables is also significant. The C.R. value is above 2.5, so H_e , H_f and H_i are established. Finally, the path coefficient of the influence of entrepreneurial innovation spirit on

innovation performance and collaborative performance variables is also significant. The C.R. value is above 4.6, so H_j and H_k are established.

3.4.2 Intermediation hypothesis test

Hayes (2009) suggested using the Bootstrap method with the strongest statistical effect to complete the mediation effect test. First, construct the Z statistic of the product ab and calculate the standard error SE, and then judge the Z value of the total, direct and indirect effects respectively. $|Z| > 1.96$ shows that the effect is significant at the 95% confidence level. Second, judge the product ab of the coefficient of the three effects separately, and the estimated 95% confidence interval CI under the bias-corrected nonparametric and non-parametric percentiles Bootstrapping should not include 0. The intermediary effect test results are shown in Table 3:

The results showed that the Z-value of the total, direct, and indirect effects of the demand-type innovation policy perception on the collaborative performance were all greater than 1.96, so all the three effects were significant under the coefficient product method. However, the Bias-Corrected method and Percentile method with only total effect and indirect effect neither contain 0 in Bootstrapping, and the Percentile method of direct effect contains the value 0 (underlined section). To sum up, the overall effect and indirect effect of demand-based innovation policy perception on collaborative performance is significant, while the direct effect is not significant, indicating that demand-based innovation policy perception has an impact on enterprise collaborative performance completely through the entrepreneurial innovation spirit, that is, the entrepreneurial innovation spirit is a complete intermediary, so H_{22} was established. Accordingly, the total effect, direct effect and indirect effect of demand-based innovation policy perception on innovation performance are all significant, and the corresponding confidence intervals do not include 0. Therefore, the perception of demand-based innovation policy partly impacts on the enterprise innovation performance through the entrepreneurial innovation spirit, and the entrepreneurial innovation spirit becomes a part of the intermediary, so H_{21} was established.

Similarly, it is easy to conclude that the three effects of supply innovation policy perception and environmental innovation policy perception on innovation performance and collaborative performance are all significant, that is, entrepreneurial innovation spirit acts as some intermediary, so H_{11} , H_{12} , H_{31} and H_{32} are established respectively. The present article hypothesis Note: all two-tailed tests, * for $p < 0.05$, ** * for $p < 0.001$; the intermediary assumes that z value is the statistic of the product of the total effect coefficient ab .

Table 3. Report of the mediation effects

Intermediary path	effect	point estimation	Coefficient product ab		Bootstrapping			
					Bias-Corrected 95%confidence interval		Percentile 95%confidence interval	
			SE	Z price	lower limit	toplimit	lower limit	toplimit
PSP→IP	Total effect	0.367	0.077	4.766	0.222	0.526	0.223	0.529
	indirect effect	0.063	0.026	2.423	0.026	0.134	0.022	0.125
	Direct effect	0.304	0.081	3.753	0.146	0.467	0.149	0.475
PSP→SP	Total effect	0.297	0.073	4.068	0.161	0.445	0.160	0.445
	indirect effect	0.069	0.025	2.760	0.031	0.134	0.027	0.127
	Direct effect	0.227	0.079	2.873	0.076	0.382	0.079	0.384

PDP→IP	Total effect	0.292	0.076	3.842	0.150	0.461	0.146	0.453
	indirect effect	0.081	0.030	2.700	0.034	0.158	0.030	0.149
	Direct effect	0.211	0.083	2.542	0.055	0.376	0.056	0.376
PDP→SP	Total effect	0.249	0.074	3.365	0.111	0.404	0.106	0.396
	indirect effect	0.089	0.030	2.967	0.044	0.165	0.039	0.154
	Direct effect	0.160	0.081	1.975	0.004	0.326	-0.001	0.320
PEP→IP	Total effect	0.235	0.052	4.519	0.133	0.340	0.135	0.342
	indirect effect	0.043	0.016	2.688	0.019	0.087	0.015	0.078
	Direct effect	0.192	0.055	3.491	0.084	0.300	0.086	0.303
PEP→SP	Total effect	0.163	0.054	3.019	0.058	0.269	0.058	0.269
	indirect effect	0.047	0.016	2.938	0.023	0.087	0.019	0.081
	Direct effect	0.116	0.056	2.071	0.004	0.225	0.004	0.225

Note: The data in this table were obtained by Bootstrap sampling 2000 times and presented as non-standardized data.

4. Conclusions and policy implications

Based on the enterprise micro-survey data, this paper finally draws the following conclusions:

(1) Innovation policy perception will directly promote the final performance evaluation of enterprise collaborative innovation performance, and partly or completely affect the performance of enterprise collaborative innovation through intermediary variables. Combined with Wen Zhonglin's (2016) view on the mediation effect size, it is still necessary to further explore the possibility of remote, multi-factor and regulated mediation mechanism on the basis of the mediation variable of entrepreneurial innovation spirit.

(2) The perception of innovation policy can also significantly and positively stimulate the innovation spirit of entrepreneurs. Only by correctly and fully perceiving the government's innovation policy support from the supply side, demand side and environmental level can entrepreneurs have more confidence and incentive input to lead enterprises to complete innovation activities.

(3) Entrepreneurial innovation spirit will also play a positive role in promoting the performance of enterprise collaborative innovation. The "push and pull role" of entrepreneurial innovation spirit, on the one hand, it is necessary to pull all the scarce external resources into the enterprise, on the other hand, it is also necessary to transfer the external positive incentives to the enterprise employees. Entrepreneurs mainly influence and improve the innovation performance of the whole enterprise and the coordination degree among the subjects through their innovative consciousness and concept and innovative personality characteristics.

The above research found that how to improve and improve the government innovation policy support of macro efforts and micro practical effect provides realistic policy enlightenment: first,

to strengthen government innovation supply, macro development market innovation demand, create a good and orderly innovation environment atmosphere, eventually form the social creativity, enterprise innovation source full flow of good situation. Second, the Chinese concept should improve the level of collaborative innovation among the government, industry, university and research, and actively promote the ecological development of regional innovation. On the one hand, it urges the government, industry, university and research institutes to gradually realize the collaborative innovation process of bilateral matching, system docking and network diffusion, so as to maximize the output benefit of innovation resources. On the other hand, it is necessary to timely control and control the chaos on the supply side of innovation policies in the region, improve the precision, directivity and effectiveness of innovation subsidies, and avoid the deficiency and mismatch of resources. We will raise the implementation of national innovation policies to a new level by enhancing the effectiveness of governance and reducing policy costs. Thirdly, at the micro level, we should promote the cultivation of entrepreneurs' innovation spirit, strengthen entrepreneurs' actual feelings of innovation policies and improve their subjective evaluation. On the one hand, we should change the concept of entrepreneurs, strengthen the consciousness of innovation, and encourage entrepreneurs to consciously practice to deepen the innovation concept. On the other hand, it is necessary to restructure entrepreneurs' innovation preferences, update the cognitive structure of management, and improve the breadth of innovation policy cognition. Then, the stock increase and structure optimization of enterprise human capital can be realized, and finally the ideal effect of improving policy perception level and improving subjective evaluation can be achieved.

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