

Analysis on Influencing Factors of Innovation Behavior of Specialized and New Enterprise Small and Micro Enterprises

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Abstract

As China continues to strengthen the cultivation of specialized and ultra-new small and micro enterprises, and promote the development of related enterprises in China's basic industries, now "specialization and innovation" enterprises have become a new power to enhance the industrial chain power and high-quality development pattern. However, the development of all kinds of "little giant" enterprises is still in the middle and low end of the industrial chain, the core creativity is still very lacking, and it is easy to be eliminated and replaced in the fierce competition of existing technology and innovation. In this regard, from the perspective of "innovation", this paper will use Probit model to empirically analyze the internal and external factors and constraints that affect the innovation behavior of small and medium-sized enterprises, among which government subsidies and human capital cultivation have significant negative and positive effects on enterprise innovation respectively. At the end of the paper, we try to find a way to solve the core problem of "innovation difficulty" of small, medium and micro enterprises under the background of "specialization and innovation" from multiple perspectives.

Keywords

Specialization and Innovation; Probit Model; Government Subsidy; Human Capital.

1. Introduction

In April 2012, the "Opinions of The State Council on Further Supporting the Healthy Development of Small and micro Enterprises" first proposed the concept of "specialization and special innovation", "encouraging small and micro enterprises to take the road of 'specialization and special innovation' and supporting development in cooperation with large enterprises". "Specialization and innovation" refers to the development characteristics of specialized, refined, characteristic and novel enterprises. By guiding the specialized and innovative development of small and medium-sized enterprises, the vitality and development power of small and medium-sized enterprises can be further stimulated, and the transformation and upgrading of small and medium-sized enterprises can be promoted. Among them, "novel" innovation standards are placed at the core, emphasizing that enterprises have core innovation capabilities and novel development momentum, have core competitiveness in key industries and basic professional fields, and achieve breakthroughs in new fields, new technologies, new breakthroughs and new prospects under the background of new high-quality development. To transform from traditional labor-intensive industries to high value-added, sophisticated and cutting-edge industries. By June 2022, China had cultivated more than 9,000 specialized and innovative "little giant" enterprises and small and medium-sized enterprises. There are more than 50,000 innovative small and medium-sized enterprises and 1 million, forming a distinctive gradient cultivation mode of ladder type small and medium-sized enterprises.

2. Development Status of Specialized and Ultra-new Small and Micro Enterprises

2.1. Centralized Distribution, High-end Enterprises.

By 2022, there are 341 state-level specialized "little giant" listed enterprises in China, which are mainly concentrated in high value-added industries such as manufacturing, information transmission and information technology service [2]. This is also consistent with the original intention of China's development of "specialization and innovation": to make great breakthroughs in key industries and basic fields.

2.2. Small Scale Enterprises, International Cooperation is Difficult.

Since it is the development situation of small and medium-sized enterprises, the scale and total assets of enterprises are relatively low, so it is difficult for small and medium-sized enterprises to have the ability to resist risks in the face of great difficulties. Especially in the current situation of epidemic prevention and control, it is difficult for small and medium-sized enterprises to carry out cooperation and exchanges with foreign enterprises, [3] which undoubtedly squeezed the living space of small and medium-sized and micro enterprises. However, there are also cases of stable cooperation with large and well-known domestic enterprises.

2.3. Strong Support and more Supportive Policies.

The support for the policy of "specialization and innovation" has always been vigorously advocated. On this basis, the state has issued a series of relevant policies to ensure and guide the orderly development of small and medium-sized enterprises to sophisticated and innovative fields. By promoting and facilitating the development of a number of small, medium and micro enterprises, the real economy will be helped to smoothly overcome the weak period and achieve high-quality economic development.

3. Existing Problems of Specialized and Ultra-new Small and Micro Enterprises

3.1. Lack of Innovation Ability.

The core meaning of the development of "specialization and innovation" is that enterprises should strengthen their understanding of "innovation", not only in the innovation of manufacturing products, but also in the innovation of "soft matter" such as enterprise management mode, service mode, cultural creativity and salary structure. "A gentleman's learning must be new, and the new person will make progress day by day. Those who do not become more and more new will fall back, and there is no one who does not continue to retreat." As mentioned above, the industry we are promoting is an enterprise with high added value, focusing on basic parts, basic equipment, key materials and other segments of the product market for a long time. [4] However, the current development status of small and medium-sized enterprises is the lack of high-end talents and the introduction and stable retention of professional and technical talents. The dilemma of "more difficult to retain" is always haunting the mind of every small and medium-sized entrepreneur. Due to the lack of professional talent introduction channels and reasonable talent training and promotion channels, it is difficult for such small and medium-sized enterprises to have a greater attraction in stabilizing talents.

3.2. Enterprise Financing Difficulties.

The financing problem of small and micro enterprises is always the key to restrict the further horizontal or vertical development of enterprises, expand the scale of manufacturing services, and form the competitiveness of clusters. Even if the state has given certain guidance and

support to small and micro enterprises in terms of policy, the universality is still very low. In the specific implementation level, different enterprises have different problems and thresholds when applying for loans, 5 which also leads to some enterprises from bank loans to private or family loans. At the same time, the loan demand of all kinds of small and micro enterprises is high. At the same time, the loan demand of all kinds of small and micro enterprises is showing the trend of continuous growth, the contradiction between supply and demand that can not be met, etc., which hinders the further survival and development of small and medium-sized enterprises. The following figure shows the loan demand index of small and micro enterprises calculated by the People's Bank of China from May 2016, which reflects the changes of bank loan demand of small and micro enterprises: Since 2016, the loan demand of small and micro enterprises has been on a steady rise. Despite a decline during the epidemic, the overall loan demand is still on the rise.

3.3. Greater Operational Risk.

Due to their small operating capital and production scale, small, medium and micro enterprises will be greatly affected by their own production and operation in the face of large economic risks and cost crises as well as changes in the external environment. With the entry of the new stage of the Omicron strain of COVID-19, 6 raw tea raw materials and the diversified demand of the market have brought many uncertain risks to the production status of small and medium-sized enterprises, and the initial investment of almost "all-out" is facing a greater threat, thus forcing the transformation of the production mode of "professional and special new" enterprises.

In fact, in addition to the main problems mentioned above, the development of "specialized and special new" enterprises also has problems such as difficulties in protecting patent and intellectual property rights and unbalanced development between different regions in China. Based on the fact that the development of "specialized and special new" takes the construction of "innovation capacity" as the core, This paper tries to use Probit model to analyze the factors affecting the insufficient innovation ability of small, medium and micro enterprises and the feasible solutions.

4. The Methods and Variables

4.1. Data Sources and Descriptive Statistics.

The main data and related variables selected in this paper are mainly from CHFS (China Household Finance Survey and Research Center). Small and Micro Enterprises Survey database in 2015. The main survey objects of this database are small enterprises, micro enterprises and family workshop enterprises with independent legal personality in China. The sample size has reached more than 5400, covering 28 provinces (autonomous regions and municipalities directly under the Central Government) in China, which is nationally representative. It is a multi-dimensional and high-quality data system of small and micro enterprises in China, supplemented by network data capture and referenced by multiple data sources. The Digital Inclusive Finance Index 7 of each province is from the Institute of Digital Finance of Peking University, which is mainly used to evaluate the differences in the level of financial innovation among provinces and regions.

The variables and descriptive statistics selected in this paper are shown in the figure below, and the meanings expressed by each variable are shown below:

Table 1. descriptive statistics

Variable	Full sample	Mean value	Standard deviation
Inov	5012	1.644	.479
Inovd	1268	519839.8	3872221
Tax	788	69538.518	291666.45
Emp	5032	1.245	.43
Pasn	5033	1.959	.744
Seri	5028	2.161496	1.199501

4.2. Model Construction and Hypothesis.

The benchmark model of this paper is used to explore the influence of various possible factors on the innovative behavior of enterprises. The OLS regression model and Probit regression model are constructed respectively in the two parts of the key explained variable Inovd and dummy variable Inov, as shown below:

$$\text{Inovdi} = \beta_0 + \beta_1 \text{Taxi} + \beta_2 \text{Empi} + \beta_3 \text{pasni} + \beta_4 \text{serii} + x_i + \varepsilon_i$$

For the virtual binary response model, we assume that the random disturbance term is subject to the normal distribution hypothesis in the case of a large sample, so we adopt the Probit model to simulate the binary classification problem, here we consider the influence of the change of independent variable on the probability of the value of the dependent variable.

$$p(\text{Inovi} = 1 \mid \text{Taxi}, \text{Empi}, \text{pasni}, \text{serii}, x_i) = \theta(x * \beta)$$

The significance of the marginal effect value of the continuous independent variable is: how much does the probability of the dependent variable increase or decrease for each unit increase of the independent variable? For the dummy variable 0-1 categorical independent variable, the marginal effect value is the percentage increase or decrease in the probability of the dependent variable for each unit increase in the variable (i.e., the categorical level changes from 0 to 1). The variables mentioned in the above two benchmark models have been explained above, and the subscript i represents the number of enterprises that each sample belongs to in 2015. Here, we give possible hypotheses, namely, the influence of each independent variable on the governmental effect of the dependent variable:

Hypothesis 1: The tax preference enjoyed by enterprises will have a positive impact on the pressure investment of enterprises, because there are more sufficient funds for various innovation activities.

Hypothesis 2: Employees who have received relevant job training are conducive to improving employees' awareness of the job, which is conducive to enterprises' innovation activities in this field.

Hypothesis 3: The higher the enthusiasm of employees is, the more motivated the employees will be, thus deepening their understanding of their own work, which is conducive to the enterprise's innovation behavior.

Hypothesis 4: The more attention business owners pay to employees' innovative behaviors, the more conducive it is to enhance the innovative atmosphere and cultural creativity within the whole company, and improve the innovation level of the enterprise.

5. Analysis of Current Political Results.

Table 2 and Table 3 in the following figure show the empirical results of OLS regression and Probit model regression respectively. According to Table 2, except Pasn, namely employees' enthusiasm for work, all the other items are significant at the 99% confidence level. The specific analysis of each variable is as follows: (1) Inconsistent with our hypothesis, the government subsidies here have a significant negative impact on the innovation behavior of enterprises. According to relevant literature and data, after enjoying more government subsidies, enterprises can increase investment in scientific and technological innovation to a certain extent, but more enterprises can enjoy convenient subsidies and capital sources, However, when more enterprises enjoy convenient subsidies and sources of funds, it is difficult for them to have more innovation power to develop new technologies and reduce and reduce costs, thus bringing negative impact on innovation behavior. (2) The coefficient of Emp is 0.256, which indicates the cognitive ability and quality of employees themselves. The improvement of quality can better serve the innovation behavior of enterprises. The improvement of training for each unit of employees can increase the innovation scale of enterprises by 0.256 units. (3) Employees' enthusiasm for work also has a positive impact on enterprises' innovation behavior, but this effect is not very significant. (4) The importance that business owners attach to employees' innovation awareness and ability has a significant positive impact on whether enterprises carry out innovation behavior.

Table 2. OLS model baseline regression results

Inovd	Coefficient	Standard deviation	T-value	P-value	Significance
Tax	$-1.93e^{-0.7}$	$5.6e^{-0.8}$	-3.44	.001	***
Emp	.256	.04	6.43	0	**
Pasn	.025	.24	1.06	.288	
Seri	.072	.015	4.83	0	***
Constant	.113	.66	1.71	.88	*
Control Xi	Yes	Yes	Yes	Yes	Yes

Note: (1)# refers to primary school and below. (2) Standard errors in parentheses. (3) * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3. Probit- model baseline regression results

Inovd	Coefficient	Standard deviation	T-value	P-value	Significance
Tax	$-7.1e^{-0.7}$	$2.64e^{-0.7}$	-2.69	.007	***
Emp	.834	.131	6.36	0	**
Pasn	.067	.07	.96	.338	
Seri	.0237	.049	4.87	0	***
Constant	-1.266	.209	-6.06	0	*
Control Xi	Yes	Yes	Yes	Yes	Yes

In the Probit model in Table 3, the key explained variable is the dummy variable, that is, whether the enterprise has carried out innovation behavior. According to the results in Table 3, we can see that after controlling related variables, except for employees' enthusiasm for work, other factors have a significant impact on the innovation behavior of enterprises, and this impact is significant at the 99% confidence level. The interpretation of the Probit model is different from that of the traditional OLS model. Taking (2) whether employees receive job training or not as an example, a positive coefficient means that the probability of an enterprise's innovative behavior will increase with each unit of job training; In contrast, the coefficient of

the amount of government subsidy is still negative, which indicates that the innovation behavior of micro, small and medium-sized enterprises will gradually decline with the increase of the amount of government subsidy, bringing a significant negative impact. Consistent with the traditional OLS regression results, the effects of the other two items are also the same, which shows that the empirical results have strong stability and practicality.

6. Research Conclusions and Policy Recommendations.

6.1. Research Conclusions and Policy Recommendations.

By using OLS model and Probit model, this paper studies the factors that affect the innovation behavior of enterprises based on the CHFS Chinese SME survey database. Under the background of China vigorously promoting the development of "specialization and innovation", we find that the amount of government's strong policy subsidies for micro, small and medium-sized enterprises is not the more the better. On the contrary, it may lead to the consequences that enterprises are stuck in the past and difficult to innovate. On the contrary, employees receive more job training, and business owners cultivate employees' innovation awareness and innovative cultural atmosphere, which greatly improves the scale of enterprise innovation.

6.2. Relevant Policy Recommendations.

(1) Implement policy subsidies and new measures to help enterprises innovate

Through this study, we find that more government subsidies for micro, small and medium-sized enterprises is not always better, and excessive subsidies will only have a reverse impact on enterprises. Therefore, the state should issue relevant policies to use the state's policy subsidies for small and medium-sized enterprises exclusively for innovation behavior and R&D investment, and reflect and report various specific implementation ways and annual relevant achievements, so as to give positive incentives to enterprises with high R&D and innovation achievements and feedback, and on the contrary, appropriate reduction should be given to those with poor use effect of the government's innovation subsidy fund. Of course, because the innovation results of scientific and technological R&D investment generally take a long time to feedback, the state and the government should analyze the feedback period according to the specific industry to maximize the positive feedback effect of scientific research investment.

(2) Focus on market infrastructure and promote balanced economic development

The distribution of innovation forms and patterns of small and medium-sized enterprises in China is extremely unbalanced. Therefore, provinces in the central and western regions should continue to strengthen the construction of science and technology market infrastructure, and provide a good environment for the development of innovation and technology by building more banks, perfecting pricing rules, improving credit environment, and implementing preferential loan policies. In addition, the central and western regions should also vigorously develop their economy. On the one hand, they should encourage enterprises and individuals to finance through credit. On the other hand, they should attract Internet enterprises to join in through the growth of regional GDP, so as to promote the popularization and development of scientific and technological innovation in the central and western regions.

(3) Focus on financing for small and medium-sized enterprises and relax constraints on corporate financing

In terms of financing for small and medium-sized enterprises, the government can promote the increase of medium and small loans by opening special channels for small and micro enterprises, optimizing the approval process, greatly expanding the coverage of government financing guarantee, and encouraging banks to issue loans to small and micro enterprises and individuals with practical incentives. Meanwhile, the government can also promote the increase of medium and small loans through peer-to-peer assistance measures. The government can also

provide loans to all small and micro enterprises in a certain area designated by each bank. At the same time, governments should improve the current policy of restricting bank credit loans, help large banks to improve risk appetite through government guarantees, increase loans to small and micro enterprises and individuals, break the "20-80 rule" of loans, and help large banks to further increase their performance from the supply side. At the same time, loosening the loan constraint policy also provides more loan opportunities for small enterprises and individuals, and encourages these small customers to increase credit, which can increase loans from the demand side.

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