Research on the Innovation Factor Agglomeration to Promote Innovation Development in Shandong Province

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Abstract. Enterprise innovation is an important source of technological innovation. The talent, project, platform and funds are important factors, influencing enterprise innovation and development. In this paper, a systematic technological innovation resources gathering towards enterprises has been analyzed in our country. It has also been researched about innovation resources gathering towards enterprises in Shandong Province, combined the Nvivo12 qualitative analysis. In order to promoting development of enterprises, the suggestion has been proposed from the perspectives of accelerating the construction of innovation platforms, increasing financial support, enhancing talent cultivation, and accelerating the coordinated development of enterprises.

Keywords: Enterprise, Talent, Platform, Innovation elements, Analysis

1 Introduction

Innovation resources are an important guarantee of innovation ability, an important support for the implementation of innovation-driven, and also transformation and development strategy. The report of the 20th Party Congress clearly puts forward "we will strengthening the deep integration of enterprise-led industry, academia and research, strengthening the status of enterprises as the main body of scientific and technological innovation, and promoting the deep integration of the innovation chain and the capital chain and the talent chain". In the development of the new era and the journey, scientific and technological enterprises has been put in an important position. Faced with the unprecedented changes, the enterprise's own innovation resources and capabilities has been difficult to meet the demand for innovation and development. Then various types of innovation resources to the enterprise agglomeration and cooperation and innovation has become the main mode of development. Therefore, under the environment of deepening the reform of science and technology system, it is great significance to explore the development path of platform, talent, and project for the gathering of innovation resources, in order to enhance the independent innovation ability of enterprises and optimize the innovation ecology.

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2 Analysis and research on innovation resource agglomeration mode in advanced provinces

With the innovation of science and technology and the enhancement of economic and social development needs, the domestic advanced provinces and cities has been researched. The strategic layout of science and technology innovation, input of innovation factors, construction of platforms, financial support, and the attraction of talents and other aspects of a series of innovative policies have been introduced. It could accelerate the gathering of innovative resources to the enterprise[1,2] , stimulating the vitality of innovation.

Jiangsu[3,4] , Zhejiang[5] , Beijing and many other provinces and cities have taken multiple initiatives to support enterprises. The formation of innovation consortia, collaborating with universities, accelerating scientific and technological research for transfer and transformation of achievements had been proposed. Meanwhile, through the major tasks of key core technology research is also as a traction for promoting high-quality development of enterprises. In Guangdong province[6], construction of major scientific and technological infrastructure had been carried out. For example, promoting the participation of enterprises, such as China National Nuclear Corporation, take participate in construction of a number of major scientific and technological infrastructures, which in the strong-flow heavy-ion gas pedal and the synthetic biological research device. Focusing on key problems in key industrial areas, Zhejiang Province issued Opinions on promoting the integration of the innovation chain industry chain development, reforming the major science and technology plans project and organization and management, highlighting the status of the main body of enterprise innovation. The project declaration of the sharp soldier program will be unveiled regardless of seniority, without setting a threshold. The chain of enterprises and the government jointly funded to strengthen the role of enterprises as the main body of major scientific and technological projects. Hunan Province issued the Innovation Talent Project Implementation Plan, highlighting the results-oriented evaluation mechanism, optimizing the selection mechanism, encouraging the discovery of high-level innovative talents in major scientific and technological projects and innovation platforms, and adopting a dynamic selection and recommendation model for high-level talents in three different categories. Hunan Province issued the Implementation Program on Promoting Provincial State-owned Enterprises to Build Original Technology Currents[7], which put forward a series of specific rules for state-owned enterprises to increase investment in science and technology and strengthen scientific and technological innovation.

3 Analysis of the Evolutionary Path of Policies

3.1 Objects, methods and framework of analysis

This paper sorts out 30 normative documents about scientific and technological innovation supporting enterprise development in Shandong Province since the 14th Five-Year Plan, and makes cluster analysis from platforms, capital projects, talents and comprehensive policies. Nvivo12[8,9] qualitative analysis software was used to analyze the governance tendency of the policy issuing department by combing the analysis of policies related to enhancing the innovation capacity of enterprises, and to further study the mode of action of the policies to

enhance the innovation capacity of enterprises, their relevance to the innovation resources, and the assessment of their effectiveness.

Analytical A two-dimensional analysis framework with the X dimension as the main axis and the Y dimension as the auxiliary axis was constructed in conjunction with the policies related to the clustering of innovation resources in Shandong Province and the promotion of enterprise innovation capacity. As shown in Figure1, the X-axis is the type of policy tools, and the Y-axis is the policy role dimension.

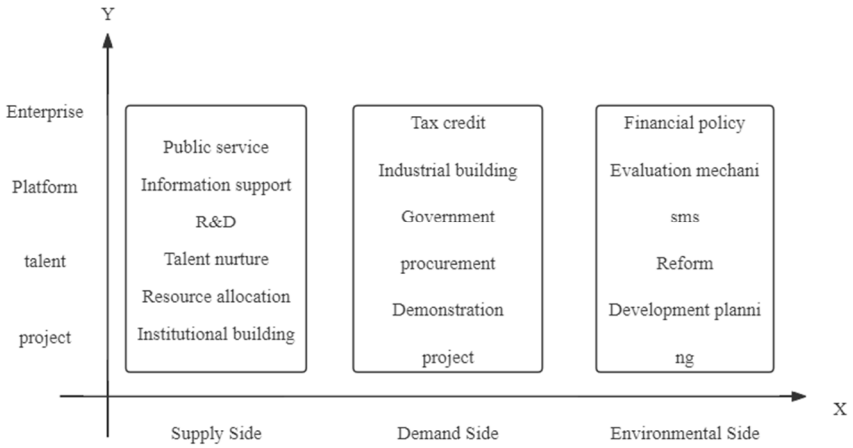

Fig. 1. The framework of policy text coding analysis

Dimension X is the types of policy instruments. Policy tools are methods and measures used by the government to solve some problems in the current context and to achieve certain purposes. According to the division of policy instruments proposed by Rothwell & Zegveld and others, the policies to promote the improvement of innovation capacity of enterprises in Shandong Province are mainly categorized into three types: supply-side policy instruments, environmental-side policy instruments and demand-side policy instruments, as shown in Table1. Dimension Y is the factor level, divided into a total of 5 levels, i.e., platforms, projects, talents, enterprises and comprehensive 5 dimensions.

Table1 Distribution of policy instruments

Tool type	Proportion
Supply side	49.21
Environmental side	40.57
Demand side	10.22

3.2 Policy analysis

Using Nvivo12 software to statistically analyze the key subject terms of the policy texts, it was found that the overall public policies to promote the improvement of enterprises' innovation capacity in Shandong Province are characterized by multiple themes and focuses, and the most

obvious themes in the clustering are science and technology, enterprises, and innovation, as seen from the clustering results, the policy support is mainly focused on projects, and the policy support for talent and platform construction is relatively weak, and in the support for enterprises, small and medium-sized enterprises (SMEs), community, industrial chain, collaborative innovation and other references are near the edge in the clustering.

In terms of the types of policy instruments, supply-type policy instruments were used most frequently, accounting for 49.21%, environment-type policy instruments accounted for 40.57%, and demand-type policy instruments accounted for 10.22%. Among them, the supply-type policies of resource allocation and institution building accounted for 14.28% and 11.71% respectively, and were used most frequently, followed by talent cultivation, which was mainly related to the treatment and protection of attracting and nurturing talents. This is followed by talent cultivation, which is mainly related to the treatment and protection of attracted talents, while information support and public services are less frequently used. Among the environment-oriented policy tools, the use of each sub-policy tool is balanced, with assessment mechanism, institutional reform and financial policy being used more frequently. Among the demand-based policy instruments, tax incentives are used more often, accounting for 5.12%, industry shaping and demonstration projects are used less frequently than tax instruments, and government procurement is used less frequently than tax instruments. Government procurement was the least used, appearing only once.

From the perspective of the policy role level, the enterprise-related coded reference points are the most numerous 205, followed by talent, projects, platforms and comprehensive categories. In terms of enterprise policies mainly focus on enterprise ladder cultivation, such as small and medium-sized enterprises to enhance innovation capacity, high-tech enterprise incubation, state-owned enterprises to increase R & D efforts, etc.; in terms of talent policies are focused on talent attraction, talent evaluation mechanism optimization and talent cultivation of the three aspects, which focuses on talent attraction; in terms of the project, the main focus is to rely on the provincial science and technology programs in Shandong Province to support enterprise innovation, of which the most important is the key R & D program, also encourages enterprises to set up their own R & D projects. In terms of projects, mainly relying on Shandong provincial science and technology program projects to support enterprise innovation, the most important of which is the key R & D program, also encourages enterprises to set up their own R & D projects, but the role of the weak; in the platform for the establishment of various types of innovation and entrepreneurship carriers, and incubators and laboratory parks, etc., the policy making route is mostly enterprise application - government support The policy formulation route is mostly enterprise application--government support--policy inclination, generally speaking, the policy density of the platform aspect is small.

4 Countermeasures and suggestions

4.1 Accelerate the construction of innovation platforms

Firstly, we will actively guide the science and technology backbone enterprises to take the lead in combining the advantageous scientific and technological strengths of key colleges and universities, research institutes and industry chain-related enterprises. In the field, it will carry out collaborative innovation and form a high-level research and development platform for the

key technologies. It actively promote the docking and integration of basic research, applied technological research and technology research. Secondly, the key universities and institutes in the province are encouraged to open their laboratories and large scientific research instruments and equipment to enterprises, strengthen the support for cutting-edge research and enterprise innovation. It could solve the problem of isolated islands of scientific and technological innovation resources, by strengthening the evaluation and assessment of the sharing of scientific research infrastructures.

4.2 Increase financial support to improve the intensity of enterprise innovation investment

Firstly, we will optimize the support system of science and technology plans. In terms of basic research, we guide the whole society's investment in science and technology to tilt towards applied basic research and key technology research[10], and continue to optimize the support system for basic research of science and technology programs, by increasing financial investment in basic research. In the major key technology research, we will continue to explore the key core technology research Shandong path, increase the proportion of participation in major scientific and technological innovation projects in the enterprise province. Secondly, the science and technology financial service system could be improved, promoting the deep integration of science and technology and finance. Strengthen the management of government investment funds such as the Results Transformation Guidance Fund, encourage and guide social capital to invest more in key technology areas and start-up science and technology enterprises[11], which could explore the establishment of a whole-process basic innovation financing model from experimental research, pilot testing to production.

4.3 Strengthen talent attraction and nurture, and promote scientific and technological innovation talents to gather to enterprises

Firstly, the introduction and cultivation of high-level talents could be actively increased. The strategic scientists, engineers in key areas of excellence, scientific and technological leaders and innovation teams could be imported. Secondly, we will create a favorable environment for the development of innovative talents in enterprises. Further break down the system barriers and mechanism obstacles in the flow of talents, and smooth the flow channels of scientific and technological talents between universities, research institutes and enterprises. Improve the evaluation system of enterprise scientific and technological talents oriented to innovation ability, quality, effectiveness and contribution, and explore diversified talent evaluation standards and evaluation methods in line with the professional characteristics of different industrial fields, enterprises in different industries and different positions.

5 Conclusion

Innovation resources are an important guarantee of innovation capability and a crucial support for implementing innovation driven development strategies. Innovative resources such as talents, projects, funds, and platforms are the core elements that promote innovative development. As the main body of technological innovation, enterprises are an important source of China's technological innovation cause. Firstly, focusing on the development needs of the province's Top Ten industries, we should actively guide universities and research institutes to carry out continuous joint research with key enterprises to form an innovation ecosystem. The major

technological tasks, innovation processes, and the transformation of innovation results are determined by the enterprises. Secondly, we will accelerate the construction of a diversified science and technology investment system with financial investment as the guide, enterprise investment as the main body, financial institutions as the support and social capital as the supplement. Thirdly, promoting innovative talents to enterprises to gather, is to enhance the technological innovation ability of enterprises, to establish the status of the main body of enterprise innovation is an inevitable requirement, It could also create a good innovation ecology.

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