

Research on the Role of Industrial Enterprise Innovation

-- Jilin Province Taken as an Example

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Abstract

Report to the 20th National Congress of the Communist Party of China proposed to "Strengthening the dominant position of enterprises in technological innovation, and developing leading and supporting role of technology-based backbone enterprises, create better environment for the growth of technology-based small, medium and micro enterprises, and promote the deep integration of the innovation chain, industrial chain, capital chain, and talent chain.". From this, it is concluded that strengthening the main role of enterprises in technological innovation is crucial to accelerating the implementation of innovation-driven development strategies. In order to accelerate the supporting role of enterprises in industrial and regional innovation and development, this paper takes industrial enterprises above designated size in Jilin Province, one of the industrial bases in Northeast China, as an example, through deep research and analysis of the role of enterprise innovation, finds advantages, problems and puts forward relevant countermeasures and suggestions.

Keywords

Enterprise; Technological Innovation; Countermeasures and Suggestions.

1. Introduction

Enterprise innovation capability refers to the collection of various capabilities to improve the level of innovation, which is the core force driving economic development. Existing literatures use different data, related processing methods and research fields, and there are different views on the relevant conclusions of the study. Some scholars believe that enterprise innovation capabilities usually run through the entire business development process of the company, such as development, production, marketing, resource allocation, and decision-making planning [1]. Some researchers emphasize that enterprises need to improve and innovate, for absorbing and mastering the knowledge and capabilities of existing technologies fully [2]. Further emphasizing that the innovation capabilities of enterprises can be divided into the following categories: the first category is the ability to learn other advanced technologies; the second category is the ability to study problems and develop them; the third category is manufacturing capabilities; the fourth category is market capabilities; the fifth category is organizational innovation capabilities, and the sixth category is strategic planning capabilities. It will be reflected in the long-term innovation activities of the enterprise and attributed to the innovation output of the enterprise [3]. The other scholars make the establishment of innovation ability index and innovation ability evaluation system to evaluate the innovation ability of enterprises. Cao Hongjun used three perspectives of innovation awareness, innovation implementation and innovation achievements to build an evaluation system for independent innovation capabilities of enterprises. In addition, they created 5 secondary

indicators and 27 tertiary indicators to build innovation capabilities of small and medium-sized enterprises[4]. When evaluating the system, it starts from the three perspectives of innovation investment, innovation foundation and innovation performance[5]. Sun Jianjun proposed 5 secondary indicators including innovation intensity, innovation resources, innovation efficiency, innovation performance and sustainability, and 21 other tertiary indicators when building an innovation capability evaluation index system[6]. In addition, some experts and scholars link innovation capability with the number of patents and the output of innovative products when measuring the standards of enterprise innovation. For example, Kou Zonglai and Liu Xueyue mentioned that there are three main indicators used to measure enterprise innovation: total factor productivity (TFP), R&D expenditure and patents, and the number of patents is used as a measure of enterprise innovation capability[7]. Based on the above literature, this paper conducts research and analysis on the input and output of industrial enterprises above designated size (hereinafter referred to as industrial enterprises), and provides relevant countermeasures and suggestions for further improving the level of innovation capabilities of industrial enterprises.

2. The Status and Role of Industrial Enterprises in Innovation and Development

In 2021, Jilin Province has 3,228 industrial enterprises, ranking 25th in the country, R&D investment is 8.58 billion yuan, ranking 25th in the country, and has 25,398 R&D personnel, ranking 24th in the country. Based on the data in 2021, the following specific analysis is carried out:

2.1. Investment Situation of Industrial Enterprises

The source of improving the level of R&D investment of Jilin Province lies in industrial enterprises. The R&D investment of industrial enterprises is 8.58 billion yuan, accounting for 46.7% of the province's investment, exceeding the proportion of scientific research institutions (31.5%) and colleges and universities (16.9%); The proportion of industrial enterprise technology acquisition and technological transformation expenditures in operating income ranks third in the country and first in innovative provinces. The development of R&D activities. Industrial enterprises with R&D activities accounted for 13.3%, an increase of 1.7 percentage points over the previous year, R&D institutions run by industrial enterprises have become an important source of high-end talents for industrial enterprises. R&D institutions run by industrial enterprises have 4,130 doctoral and master personnel, accounting for 29.1% of the organization's personnel, ranking third in the country and first in innovative provinces. It is 16.7 percentage points higher than the average proportion (12.4%) of R&D institutions run by industrial enterprises across the country. The R&D personnel input. R&D personnel were 25,398, an increase of 27.5% over the previous year.

2.2. Implementation of Regional Development Strategies Promoted by Industrial Enterprises

The contribution rate of the added value of industrial enterprises in Jilin Province to the province's GDP is 29.0%. Among them, Changchun and Jilin have 1,326 and 440 industrial enterprises respectively, and the industrial enterprises in the two regions account for 54.7% of the province. The contribution rates of enterprise added value to regional GDP are 34.8% and 30.0% respectively, both higher than the provincial average.

2.3. Economic Benefits of Innovative Products in Industrial Enterprises

New products provide strong momentum for the high-quality development of enterprises in Jilin Province. The number of new product development projects of industrial enterprises was

4,369, an increase of 16.8% over the previous year. The sales revenue of new products was 295.51 billion yuan, accounting for 20.1% of the operating income, ranking 13th in the country.

3. Related Problems Faced by Industrial Enterprises

(1) Among the 2.50 billion yuan of External Expenditure on R&D of industrial enterprises, expenditures on domestic scientific research institutions accounted for 12.1%, ranking 26th in the country, and expenditures on domestic universities accounted for only 5%, ranking 24th in the country.

(2) The number of application-oriented achievements of industrial enterprises is less. The number of invention patent applications of industrial enterprises accounted for 25.1% of the number of invention patent applications in Jilin Province, ranking 24th in the country, 9.5 percentage points lower than the national average level of industrial enterprises (34.6%).

(3) Insufficient investment in scientific and technological innovation of industrial enterprises. Firstly, the number of industrial enterprises is less. Jilin Province has 3,228 industrial enterprises, ranking 25th in the country. Secondly, the enthusiasm for R & D activities is not high. There are 429 industrial enterprises with R&D activities, accounting for 13.3%, ranking 29th in the country; the number of R & D institutions run by industrial enterprises is 158, ranking 28th in the country. Thirdly, the level of R & D investment is low. The R & D personnel of industrial enterprises account for 29.2% of the R & D personnel of in Jilin Province, ranking 28th in the country; R&D investment of industrial enterprises accounted for 0.6% of business revenue, ranking 27th in the country. Fourthly, the R & D investment of industrial enterprises in Jilin Province accounted for only 2.05% of government funds, ranking 23rd in the country.

(4) The ability of industrial enterprises to undertake the transformation of scientific and technological achievements is not strong. The turnover of absorbing technology contracts is an important indicator reflecting the level of enterprises' ability to undertake the transformation of scientific and technological achievements. According to the "2022 National Technology Market Statistical Annual Report", the turnover of absorbing technology contracts in Jilin Province is 18.74 billion yuan, ranking last among the three northeastern provinces .25.1% of Liaoning Province, and 54.1% of Heilongjiang Province.

4. Countermeasures and Suggestions

4.1. Accelerating the Reform of the Scientific and Technological System and Creating a Sound Innovation Ecosystem

Firstly,,it is important to establish institutional system to ensure high-level technological self-reliance and self-improvement. Through the promulgation of the "Jilin Province Science and Technology Innovation Regulations", the reform of the allocation is deepen and mechanism of fiscal science and technology funds is used, and the efficiency of science and technology investment is imoroved. Secondly, it is to strengthen the construction of scientific research integrity, promote the governance of scientific and technological ethics, and create a clean and upright scientific research environment actively . Thirdly,it is to use the evaluation of scientific and technological achievements as a baton, and give the achievement completion team greater autonomy and decision-making power by increasing the proportion of net income distribution, so as to further stimulate the enthusiasm of scientific researchers and managers to transform their achievements. Fourthly,it is to implement the integrated mechanism of cultivating, attracting, employing, and retaining talents. It is suggested that on the basis of cultivating and retaining local talents, and at the same time, the incremental introduction of talents is urgently needed for the development of key areas in the region.

4.2. Creating an Atmosphere of Comparing Learning and Catching up with and Exceeding, Promoting Regional Collaborative Innovation and Development

In the process of building an innovative province, through the use of the "horse racing" mechanism to establish a more effective evaluation mechanism, reward and punishment mechanism, and supporting service mechanism, the vitality of scientific and technological innovation in the entire region will be fully stimulated. Considering the uneven distribution of scientific and technological resources in various regions, the relationship between innovation efficiency and innovation capabilities should be effectively coordinated, and efforts should be made to take into account "the head horse is faster" and "the horses are running together", so as to achieve the goal of Changchun becoming a national science and technology innovation center as soon as possible. At the same time, other regions continue to improve the level of regional scientific and technological innovation by catching up with others.

Establishing joint mechanism for scientific and technological innovation cooperation to comprehensively and enhancing the independent innovation capabilities of innovation entities. By combining "government, enterprises, scientific research institutions and institutions of higher learning, talents, applications, finance, intermediaries, innovation environment with big data", the main body of innovation will be boosted to better support regional innovation and development. In addition, by opening up the "two-way channel" of talent flow, scientific and technological talents from colleges and universities and scientific research institutions are encouraged to concurrently serve as "science and technology innovation specialists" in science and technology enterprises, and at the same time, influential professional and technical personnel or managers of enterprises are supported to go to colleges and universities and Scientific research institutions serving as industry professors, effectively improving the level of cooperative education among innovation subjects and promoting the transformation of scientific and technological achievements of enterprises.

4.3. Increasing Financial Expenditure on Science and Technology to Enhance the Level of Scientific and Technological Innovation and Development in Jilin Province

In order to better and faster strengthen the construction of an innovative province in our province, it is recommended to appropriately increase the proportion of science and technology expenditures in local fiscal expenditures, and strengthen the institutional guarantee for local fiscal science and technology expenditures. In addition, in order to stimulate the role of innovation subjects, colleges and universities and scientific research institutions should be guided and supported to actively use transformable scientific and technological achievements for service enterprises, according to the transfer, licensing or pricing investment agreements among them and the actual situation of the transformation and industrialization of achievements, focusing on giving colleges and universities. Relevant government financial support for colleges or scientific research institutions encourages them to further promote the transformation of relevant scientific and technological achievements.

Acknowledgments

The authors gratefully acknowledge the financial support from "Research on the Implementation Path of Jilin Province's Science and Technology Innovation Assessment and Evaluation and the Construction of Innovative Province Using the 'Horse Racing' Mechanism to Enhance Science and Technology Innovation Capability(JL2023-19)" funds.

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