The Impact of Technological Innovation on Industrial Structure Adjustment and Regional Economic Growth from the Perspective of Applied Economics

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Abstract: Under the background of intensified global competition and rapid growth of sci & tech, this article deeply discusses the core role of technological innovation in promoting industrial structure adjustment and regional economic growth, aiming at revealing how technological innovation has become the key driving force to promote high-quality economic growth. Firstly, this article constructs the theoretical framework of technological innovation, industrial structure adjustment and regional economic growth, and defines the definition and classification of technological innovation and its importance to economic structure optimization. Subsequently, through a detailed analysis of the direct and indirect effects of technological innovation on regional economic growth, this article reveals the positive role of technological innovation in improving production efficiency, creating new markets, promoting knowledge spillover and industrial upgrading. Although technological innovation is an important force to promote economic growth, its function is influenced by many factors and needs the joint efforts of the government, enterprises and all walks of life. Based on this, this article puts forward a series of policy suggestions, including increasing investment in innovation, improving the mechanism of achievement transformation and formulating scientific industrial and regional policies, aiming at building a good environment conducive to technological innovation and economic growth.

1. Introduction

With the deepening of globalization today, the economic ties among countries in the world are getting closer and closer, and the global economic structure is undergoing unprecedented changes [1]. In this change, technological innovation has undoubtedly become a new driving force to promote economic growth [2]. With the rapid growth of sci & tech, emerging industries are constantly emerging, and traditional industries have been transformed and upgraded under the impetus of technology [3]. Technological innovation not only improves production efficiency and reduces costs, but also promotes new economic growth points and injects new vitality into the global economy [4].

At the same time, the importance of industrial structure adjustment and regional economic growth for national economic growth has become increasingly prominent [5]. Regional economic growth is an important support for national economic growth. By promoting the coordinated economic growth in different regions, the balanced and sustainable growth of the national economy can be achieved [6].Under the current global economic background, how technological innovation affects industrial structure adjustment and regional economic growth, and how to promote the growth of these two aspects through technological innovation is still an urgent problem [7]. Therefore, exploring how technological innovation affects industrial structure optimization and regional economic development has profound theoretical significance and shows its important practical application value. This can provide data support and theoretical reference for government agencies to formulate effective policies, help scientific decision-making, and point out the direction for enterprises' technological innovation path selection and industrial upgrading strategy. This study will focus on the specific impact of technological innovation on industrial structure transformation and regional economic growth.

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2. Theoretical basis of technological innovation and industrial structure adjustment

2.1. Definition and classification of technological innovation

As the core power to promote social progress and economic growth, technological innovation has a wide and profound connotation. It not only covers the growth of new products and services, but also includes the optimization of production processes, the innovation of management methods and the reconstruction of market organizations [8]. From an economic point of view, technological innovation is an activity that can significantly improve production efficiency, reduce costs, create new market demand or improve the performance of existing products. According to the nature and purpose of innovation activities, technological innovation can be divided into product innovation, process innovation, organizational innovation and market innovation. Product innovation focuses on developing brand-new products or improving the functions and characteristics of existing products to meet the changing needs of consumers. Process innovation focuses on the improvement of production technology and technological process, aiming at improving production efficiency and resource utilization. Organizational innovation pays attention to the optimization of internal management structure and external cooperation relationship of enterprises in order to promote the effective allocation of innovation resources. Market innovation opens up new market space through new marketing strategies and channel expansion. These different types of innovation interact to form a powerful engine to promote industrial structure upgrading and economic growth.

2.2. The motivation and path of industrial structure adjustment

The adjustment of industrial structure is an inevitable phenomenon in the process of economic growth, which contains profound motives and diversified paths. Figure 1 shows the main motivation of industrial structure adjustment.

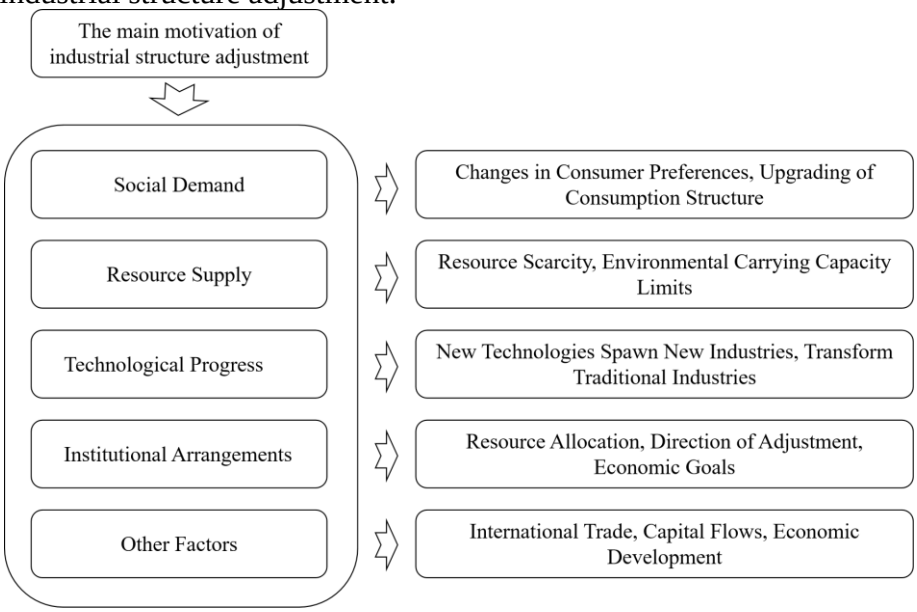

Figure 1 The main motivation of industrial structure adjustment

The scarcity of resources and the limitation of environmental carrying capacity also force the industry to develop in a greener and more efficient direction. Technological progress provides strong technical support for industrial structure optimization, and promotes the replacement of old and new industries and industrial upgrading. Policy environment, including industrial policy, scientific and technological innovation policy, etc., guides the flow of resources to industries with high efficiency and high added value by providing incentives or restrictions.

2.3. Interactive mechanism between technological innovation and industrial structure adjustment

On the one hand, technological innovation is the key force to promote industrial restructuring. The emergence and application of new technologies can not only directly promote new industries

and formats, but also transform and upgrade traditional industries through infiltration and integration effects, and promote the transformation of industrial structure from low added value to high added value and from labor-intensive to technology-intensive. Technological innovation also influences the allocation of resources by changing the relative prices of production factors, and guides production factors such as capital and labor to flow to more efficient and competitive industries, thus accelerating the optimization and upgrading of industrial structure. The optimization of industrial structure also provides better resource allocation and synergy for technological innovation, and promotes the effective integration of innovative resources and the rapid diffusion of innovative achievements.

3. Mechanism analysis of technological innovation promoting regional economic growth

3.1. The theoretical framework of regional economic growth

As an important field of economic research, regional economic growth aims to explore the dynamic change process of economic aggregate and economic structure in a specific region and the driving factors behind it. The traditional theory of regional economic growth emphasizes the contribution of capital accumulation, labor growth and technological progress to economic growth. The new economic geography further reveals the influence of spatial agglomeration, knowledge spillover and inter-regional interaction on regional economic growth. Under these theoretical frameworks, technological innovation is regarded as one of the core driving forces to promote regional economic growth. It can not only directly improve production efficiency and product quality, but also indirectly promote economic growth by affecting the spatial layout and industrial structure of regional economy.

3.2. The direct effect of technological innovation on regional economic growth

The direct effect of technological innovation on regional economic growth is mainly reflected in the improvement of production efficiency, the creation of new products and services and the increase of employment and investment. Technological innovation directly improves the production efficiency and competitiveness of enterprises by improving the production process and improving the efficiency of resource utilization, thus increasing the regional economic output. Technological innovation can create brand-new products and services, meet the new demand of the market, and even create a brand-new market, bringing new growth points to the regional economy. Technological innovation has also directly promoted the growth of regional economy by attracting investment and creating employment opportunities. The emergence of new technologies is often accompanied by new investment opportunities, attracting a large amount of capital inflows and providing financial support for regional economic growth. At the same time, technological innovation has also created new jobs, improved the income level of residents, and further stimulated the consumption demand and investment demand of regional economy.

3.3. Indirect effects of technological innovation on regional economic growth

In addition to direct effects, technological innovation has a far-reaching impact on regional economic growth through a series of indirect mechanisms. Technological innovation has promoted the spillover of knowledge and the diffusion of technology, and improved the productivity level of the whole region. The emergence and application of new technologies are often accompanied by the accumulation of knowledge and the upgrading of skills. These knowledge and skills are spread in the region through personnel flow and technical exchange, which has promoted the technological progress and industrial upgrading of other enterprises.

The birth of emerging technologies can often open up new paths for industrial development, catalyze the innovation and upgrading of traditional industries, and lead the industrial structure to evolve into a high-efficiency, environment-friendly and sustainable model. This transformation not only enhances the comprehensive competitiveness of the regional economy, but also builds a solid foundation for its long-term development. In addition, technological innovation has accelerated the

balanced growth of regional economy by reshaping the geographical pattern of regional economy. It transcends geographical boundaries, promotes the efficient allocation of resources and deepens the integration and coordinated development of regional economy. Therefore, the indirect contribution of technological innovation is reflected in upgrading regional technical standards, improving industrial structure and optimizing spatial allocation, which has injected surging momentum into the sustained prosperity of regional economy.

4. Challenges and countermeasures

4.1. Current challenges

In the process of technological innovation promoting industrial restructuring and regional economic growth, we are faced with multiple challenges, which come from both technological innovation itself and deep-seated problems of social and economic systems, as shown in Figure 2:

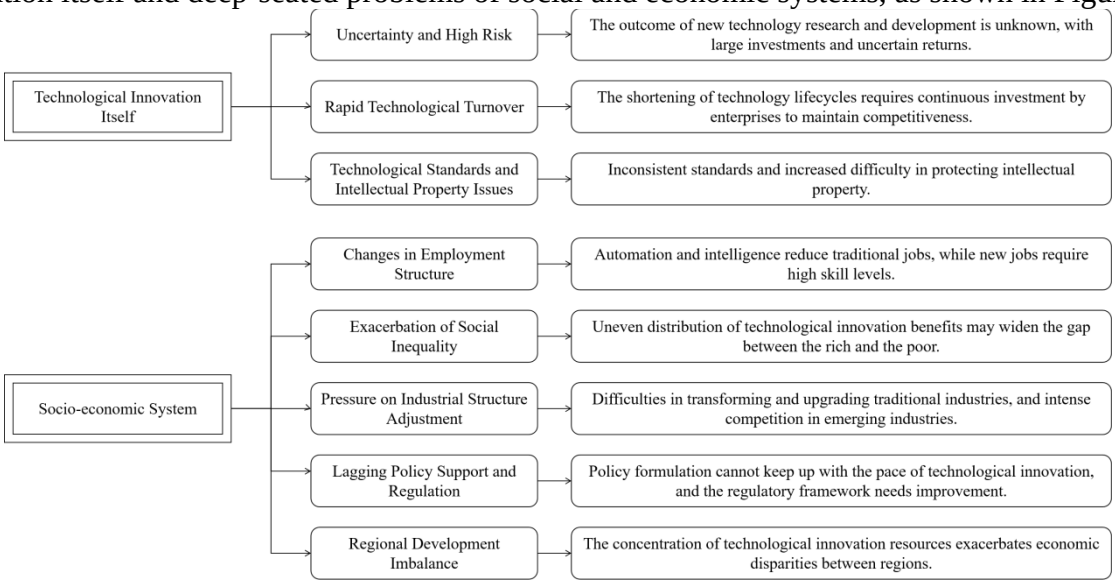

Figure 2 Technological innovation promotes industrial adjustment and challenges faced by regional growth

The research, development and application of new technologies often require a lot of capital investment and long-term accumulation, but the results are full of uncertainty, which may lead enterprises and investors to hesitate and be conservative in innovation decisions. The transformation mechanism of technological innovation achievements is not perfect. Although we have made many breakthroughs in the field of scientific research, how to turn these scientific research achievements into actual productive forces is still an urgent problem to be solved. Technological innovation may also bring about changes in employment structure and aggravation of social inequality. With the popularization of automation and intelligent technology, some traditional jobs may be replaced by machines, resulting in some workers losing their jobs or facing difficulties in career transformation. At the same time, the uneven income distribution of technological innovation may also aggravate social inequality.

4.2. Policy advice

Based on the above analysis, this article makes the following suggestions: firstly, government departments need to strengthen investment in technological innovation and improve innovation efficiency to ensure the lasting driving force of regional economic growth. Secondly, optimize the allocation of technological innovation resources, strengthen the integration and coordination of innovation chain, industrial chain and capital chain, and accelerate the transformation of scientific and technological achievements into practical applications. Furthermore, the government should pay attention to regional characteristics, carry out targeted technological innovation strategies according to local conditions, so as to promote regional technological innovation and industrial

upgrading. Finally, the government should strengthen policy guidance and support, build a policy framework and market environment conducive to technological innovation, encourage enterprises and individuals to innovate, and work together to promote the stable and healthy development of regional economy.

5. Conclusions

This article deeply analyzes the key role of technological innovation in promoting industrial structure transformation and driving regional economic growth. Through comprehensive discussion, we clarify that technological innovation is the core engine that catalyzes the upgrading of industrial structure and the lasting vitality of regional economy. It can not only enhance the competitive advantage of industries, promote the rise of new industries, but also accelerate the circulation and integration of economic resources between regions and inject new impetus into regional economies. These insights highlight the core position of technological innovation in formulating economic growth strategies and provide a solid basis for policy planning.

Follow-up research can explore in more detail how technological innovation affects different industries and regions, and seek to amplify its positive effects through policy fine-tuning. Policymakers need to deeply understand the decisive contribution of technological innovation to economic expansion, build technological innovation strategies based on scientific principles, and optimize the overall planning and deployment of innovative resources. In addition, we should take scientific and technological innovation as the guide, continue to promote the advanced evolution of industrial structure and regional economic structure, and ensure that the economy moves forward to the track of sustainable growth.

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