

Research on the impact of regional innovation capability on high-quality economic development in Anhui Province

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Abstract

This study aims to explore the impact mechanism of regional innovation capabilities on high-quality economic development in Anhui Province. By systematically sorting out relevant theoretical and empirical research at home and abroad, the main problems faced by Anhui Province in improving regional innovation capabilities are analyzed, and corresponding countermeasures and suggestions are put forward. The research uses multiple methods such as literature review, statistical analysis and case analysis to comprehensively evaluate Anhui Province's innovation capabilities and economic development status. The results show that Anhui Province has made significant progress in the field of scientific and technological innovation, but it still faces challenges such as poor economic structure, uneven regional development, and talent shortage. The study found that innovation capabilities play a key role in promoting high-quality economic development in Anhui Province, and significantly improve the quality of economic growth by promoting industrial structure optimization, technological progress and production efficiency improvement. Based on this, this study puts forward specific suggestions such as strengthening government policy support, increasing investment in scientific research, optimizing the innovation environment, and promoting industry-university-research cooperation to further enhance Anhui Province's regional innovation capabilities and promote high-quality economic development. The research conclusions not only have important practical significance for Anhui Province, but also provide useful reference for other regions.

Keywords

Regional innovation capability, high-quality economic development, Anhui Province, scientific and technological innovation.

1. Introduction

1.1. Research background and significance

As an important province in central China, Anhui Province has made remarkable achievements in economic development in recent years. Its GDP growth rate remains the highest in the country, the process of industrialization and urbanization is accelerating, and its scientific and technological innovation capabilities are constantly increasing. However, Anhui Province also faces many challenges. First, the economic structure needs to be optimized, the proportion of traditional industries is large, and the phenomenon of low scientific and technological content and added value still exists. Secondly, regional development is unbalanced, and core cities such as Hefei have a large gap in economic development and innovation capabilities compared with other cities. In addition, the talent introduction and cultivation mechanism needs to be

improved, and there is a shortage of high-level innovative talents, which affects the transformation and application of scientific and technological innovation results.

Innovation capability plays a key role in promoting high-quality economic development. Innovation is not only an important way to improve the quality of economic growth, but also the core driving force for optimizing the industrial structure and enhancing international competitiveness. Through scientific and technological innovation, we can promote the transformation and upgrading of traditional industries, stimulate the development of emerging industries, and realize the transformation of the economy from quantitative expansion to qualitative improvement. Under the national innovation-driven development strategy, Anhui Province urgently needs to improve regional innovation capabilities, break through existing development bottlenecks, and achieve high-quality economic development.

Choosing Anhui Province as the research object has important practical significance. On the one hand, the economic development of Anhui Province is typical, and its performance in the rise of central China provides a reference for other provinces. On the other hand, Anhui Province has taken a number of positive measures in scientific and technological innovation in recent years, such as the construction of the Hefei Comprehensive National Science Center, which provides rich practical cases for studying the relationship between regional innovation capabilities and high-quality economic development. Therefore, studying the impact of regional innovation capabilities in Anhui Province on high-quality economic development will not only help to summarize experiences and lessons, but also provide an important reference for high-quality economic development across the country.

1.2. Research objectives and questions

The main purpose of this study is to explore the impact mechanism of regional innovation capacity on high-quality economic development in Anhui Province, analyze the main problems faced by Anhui Province in the process of improving regional innovation capacity, and put forward corresponding countermeasures and suggestions. Specifically, this study will reveal the key role of innovation capacity in promoting high-quality economic development in Anhui Province through theoretical analysis and empirical research, evaluate the contribution of different innovation factors to economic growth, and explore the path to improve regional innovation capacity in Anhui Province.

In order to achieve the above objectives, this study proposed the following core research questions: First, what is the current status of regional innovation capacity in Anhui Province? What are its advantages and disadvantages? Second, how can regional innovation capacity promote high-quality economic development by influencing industrial structure, technological progress and other channels? Third, what are the main challenges facing Anhui Province in the process of improving its regional innovation capacity? Finally, how can we put forward practical countermeasures and suggestions for these challenges to promote high-quality economic development in Anhui Province?

1.3. Research Methods and Structure

This study adopts a variety of research methods and ideas to ensure the comprehensiveness and scientificity of the research. First, through the literature review method, the relevant theoretical and empirical research on innovation capability and high-quality economic development at home and abroad is systematically sorted out to lay a theoretical foundation for the research of this paper. Secondly, using statistical analysis methods, the innovation capability and economic development data of Anhui Province are collected and analyzed to evaluate the actual contribution of innovation factors to economic growth. Thirdly, through the case analysis method, representative regions and enterprises in Anhui Province are selected to deeply explore their innovation practices and effects.

The paper is structured as follows: Chapter 1 is an introduction, which introduces the research background, significance, purpose and problems, as well as the research methods and structure. Chapter 2 is a literature review, which systematically reviews and summarizes relevant theories and research results. Chapter 3 is an analysis of the current status of regional innovation capabilities in Anhui Province, and a detailed analysis of the various indicators of Anhui Province's innovation capabilities and their regional distribution. Chapter 4 is an analysis of the current status of Anhui Province's high-quality economic development, evaluating the main indicators and existing problems of Anhui Province's economic development. Chapter 5 is an analysis of the impact of regional innovation capabilities on high-quality economic development. Combining theoretical and empirical data, it deeply explores the role of innovation capabilities in the high-quality economic development of Anhui Province. Chapter 6 is a conclusion and suggestion, which summarizes the research findings, puts forward policy recommendations and future research directions.

2. literature review

2.1. Research on regional innovation capabilities

Cook Philip (1992) first proposed the concept of regional innovation system. He believed that regional competitive supervision of innovation system plays an important role and studied innovation subjects. Qu Hui et al. (2019) measured 9 prefecture-level cities in Fujian Province and adopted the concept of industrial knowledge diversity as an evaluation method. Lalluca Irina Kripa et al. (2019) believed that regional innovation also involves absorption efficiency. If resources are only invested blindly, the improvement of regional innovation capacity will be limited. Therefore, we cannot only look at the influencing factors and simply increase the investment in a certain indicator. We must also take into account efficiency and benefits. Ju Wenzhong et al. (2022) analyzed the differences and connections between the national innovation system and the regional innovation system from a macro perspective. On the basis of the linkage between science and technology, "dual circulation" and national will, they clarified the scope, scale, interests, layout and influencing factors of innovation elements belonging to the region.

2.2. Research on high-quality economic development

Ram Rati (1997) pointed out that economic development does not lead to the reduction of economic inequality, but instead presents a positive U model. Popkova et al. (2010) added the time dimension to the original research, and further analyzed the characteristics and attributes of economic growth quality in the spatial dimension. Zhu Yanqing (2020), based on the previous scholars, proposed to build an index system from four aspects: economic vitality, innovative development, green development and people's livelihood for the high-quality economic development of Jiangxi Province. Li Huajun (2021) mainly considered the three perspectives of balance and sufficiency, development momentum and structural balance in China's economic development, and derived a new evaluation system from the perspectives of system , connotation, process and comprehensiveness, and improved the construction of the index system of high-quality economic development on the basis of existing theories. Akmal et al. (2022) added foreign investment factors to the study of economic growth quality.

2.3. Research on the relationship between regional innovation capability and high-quality economic development

Huang Hui (2018) explained the important position of innovation in high-quality economic development from the perspective of science and technology through the five major concepts of high-quality economic development. Liu Hedong et al. (2020) used a coupling coordination evaluation model to construct an indicator system for innovation-driven development in 30

provinces across the country over the past decade, and analyzed that China's overall situation is declining from east to west and from coastal to inland. Filippopoulos et al. (2021) adopted different performance groups for regional innovation in Europe to identify the influencing factors of innovation to analyze local economic development, especially for backward areas. A new path for public R&D to drive regional innovation was proposed. Marta Gasparin et al. (2021) studied the actual difficulties faced by the regional innovation capability system, and further provided policy planning to meet economic needs by overcoming the problems encountered in the innovative economic development model.

3. Analysis on the current situation of regional innovation capability in Anhui Province

3.1. Overall situation of Anhui Province's innovation capability

Anhui Province has vigorously promoted scientific and technological innovation in recent years, and its innovation capabilities have been significantly improved. From the perspective of scientific research investment, Anhui Province's R&D funding has increased year by year, especially the proportion of investment in high-tech fields has increased significantly. According to the latest statistics, Anhui Province's R&D investment intensity (R&D/GDP) continues to increase and is close to the national average. In terms of scientific and technological output, Anhui Province has made breakthrough progress in many scientific and technological fields, and the quantity and quality of scientific and technological achievements have been significantly improved. In terms of the number of patents, Anhui Province's invention patent applications and authorizations continue to grow, especially in the fields of integrated circuits, new materials, and biomedicine. These indicators show that Anhui Province has made significant progress in improving its innovation capabilities and has initially formed a good innovation ecosystem.

3.2. Regional distribution of main innovation elements

There are obvious differences in the innovation capabilities of various regions in Anhui Province. As the provincial capital and an important national science and technology innovation center, Hefei has gathered a large number of scientific research resources and innovation elements, and has many high-level scientific research institutions and high-tech enterprises. Its scientific research investment and scientific and technological output far exceed other regions. Bengbu, Wuhu and Ma'anshan also perform well in innovation capabilities. These regions have formed a relatively complete innovation chain in their respective advantageous industries. However, other regions have relatively weak innovation capabilities, and their scientific research resources and innovation outputs are obviously insufficient, and the problem of unbalanced regional development is more prominent. This difference not only reflects the differences in the economic foundation and industrial structure of various regions, but also reveals the challenges faced by Anhui Province in promoting balanced regional development.

3.3. Innovation policies and their effects

In order to enhance regional innovation capabilities, Anhui Province has introduced a series of innovation policies and measures in recent years, including the establishment of the Hefei Comprehensive National Science Center, the promotion of major scientific and technological innovation projects, and the implementation of policies for the transformation of scientific and technological achievements. These policies have played an important role in enhancing regional innovation capabilities. For example, the construction of the Hefei Comprehensive National Science Center has greatly enhanced Anhui Province's position in the national innovation system and attracted a large number of high-end talents and innovation resources. In addition, Anhui Province has also actively promoted the transformation of scientific and technological

achievements and enhanced the independent innovation capabilities of enterprises by increasing financial support, optimizing the innovation environment, and promoting industry-university-research cooperation. Despite this, regional differences in policy effects still exist, and some regions have deficiencies in policy implementation and resource utilization. It is necessary to further optimize and improve the policy system to ensure balanced development across the province.

4. Analysis of the current status of high-quality economic development in Anhui Province

4.1. Overall economic development in Anhui Province

In recent years, Anhui Province has made remarkable achievements in economic development, with its GDP growth rate remaining at the forefront of the country, showing strong growth momentum. In 2022, Anhui Province's total GDP will exceed 4 trillion yuan, a year-on-year growth of 6.5%, higher than the national average. The industrial structure has been continuously optimized, and the proportion of the tertiary industry has increased year by year, becoming an important engine of economic growth. At the same time, Anhui Province has also made great progress in industrialization and urbanization. High-tech industries and strategic emerging industries have developed rapidly, and the pace of manufacturing upgrading has accelerated. In terms of income level, the income of urban and rural residents has grown steadily, the income gap between urban and rural areas has gradually narrowed, residents' consumption power has significantly improved, and economic development has led to a significant improvement in social well-being.

4.2. Measuring indicators of high-quality economic development

In order to comprehensively evaluate the high-quality development of the economy, it is necessary to adopt multi-dimensional measurement indicators. First, as an important indicator of environmentally friendly economic development, green GDP reflects the degree of dependence of economic growth on environmental resources and the effectiveness of environmental protection. Anhui Province has achieved certain results in promoting green development, and the proportion of green GDP has increased year by year. Secondly, total factor productivity (TFP) is an important indicator for measuring the efficiency of economic growth, reflecting the comprehensive contribution of capital, labor and technological progress to economic growth. Anhui Province has continuously improved total factor productivity through scientific and technological innovation and industrial upgrading. Finally, the innovation-driven index is a comprehensive indicator for measuring economic innovation capabilities, including R&D investment intensity (R&D/GDP), number of patents and technology market transaction volume. Anhui Province has performed outstandingly in innovation-driven development, and the innovation-driven index has increased year by year, providing strong impetus for high-quality economic development.

4.3. Regional differences in economic development

There are large differences in the level and structure of economic development in different regions of Anhui Province. As the provincial capital and economic center, Hefei City leads the province in terms of GDP and growth rate, with an optimized industrial structure and outstanding innovation capabilities. It is an important engine for the province's economic development. Wuhu, Ma'anshan and other places also performed relatively well. These regions have formed a strong industrial cluster effect in the fields of automobiles, equipment manufacturing and new materials. However, the economic development in northern Anhui and some underdeveloped areas is relatively backward, with a single industrial structure, mainly relying on traditional agriculture and low value-added manufacturing, and insufficient

economic development momentum. The differences in regional economic development not only reflect the differences in economic foundations and resource endowments in various places, but also reveal the challenges faced by Anhui Province in achieving balanced regional development. In response to these problems, it is urgent to take measures to promote regional coordinated development, narrow the gap in economic development, and achieve high-quality economic development in the province.

5. Analysis on the impact of regional innovation capabilities on high-quality economic development

5.1. Theoretical connection between innovation capability and high-quality economic development

Innovation capability is the core driving force for high-quality economic development. In theory, innovation can promote economic development in many ways. First, innovation drives industrial upgrading, promotes the transformation of traditional industries towards high added value and high technology content, and enhances the overall economic competitiveness. Second, innovation optimizes resource allocation, improves resource utilization efficiency, reduces waste, and promotes green economic development through technological progress and management innovation. In addition, innovation enhances the competitiveness of enterprises and countries and enhances their position in the global market. Innovation capability also promotes the transformation and application of scientific and technological achievements, drives the growth and development of emerging industries, and forms a new driving force for economic growth. These theoretical connections show that improving innovation capability is crucial to achieving high-quality economic development.

5.2. Anhui Province's innovation-driven economic development model

Anhui Province has vigorously promoted the innovation-driven development strategy in recent years and achieved remarkable results. Taking Hefei City as an example, through the construction of Hefei Comprehensive National Science Center, a large number of high-end scientific research resources and talents have been gathered, and it has become an important base for national scientific and technological innovation. Hefei City has achieved a number of major scientific and technological breakthroughs in the fields of quantum information, new energy vehicles and intelligent manufacturing, promoting the development and upgrading of related industries. Wuhu City, through the introduction and cultivation of a number of high-tech enterprises, has formed a relatively complete industrial chain and enhanced the competitiveness of the regional economy. These actual cases show that innovation capabilities have significantly improved the economic development level of Anhui Province, promoted the optimization and upgrading of the industrial structure, and promoted the high-quality development of the regional economy.

5.3. Paths to improve innovation capabilities

In order to further enhance the regional innovation capacity of Anhui Province, various measures need to be taken. First, increase investment in scientific research, increase financial support for basic research and applied research, encourage enterprises to increase investment in research and development, and enhance independent innovation capabilities. Secondly, optimize the innovation environment, improve the intellectual property protection system, create a good innovation ecology, and attract more high-level innovative talents and teams to settle in Anhui. In addition, strengthen industry-university-research cooperation, promote in-depth cooperation between universities and scientific research institutions and enterprises, and promote the transformation of scientific and technological achievements. The government should also introduce relevant policies to support the development of emerging industries,

provide financial, policy and technical support, and promote high-quality economic development. Through these paths, Anhui Province can continuously enhance its regional innovation capabilities and help the sustained and healthy development of the economy.

6. Conclusion and Suggestions

6.1. Research conclusions

This study draws the following main conclusions by analyzing Anhui Province's regional innovation capabilities and its impact on high-quality economic development. First of all, Anhui Province has made significant progress in innovation capabilities, especially in terms of scientific research investment, scientific and technological output and number of patents. However, there are significant differences in innovation capabilities between different regions, with core cities such as Hefei performing well, while other regions still need to be strengthened. Secondly, innovation capabilities have significantly promoted the high-quality economic development of Anhui Province by promoting industrial upgrading, optimizing resource allocation and enhancing competitiveness. Finally, Anhui Province has achieved some successful experiences in the innovation-driven development model, but it also faces challenges such as talent shortage and the innovation environment that needs to be optimized. These conclusions answer the questions raised by the study, namely, how regional innovation capabilities in Anhui Province affect high-quality economic development, and provide empirical basis for policy formulation.

6.2. Policy recommendations

Based on the research findings, the following policy recommendations are put forward to enhance the regional innovation capacity of Anhui Province and promote high-quality economic development. First, investment in scientific research should be increased, especially financial support for basic research and applied research, to encourage enterprises to increase R&D investment and enhance independent innovation capabilities. Secondly, optimize the innovation environment, improve the intellectual property protection system, establish and improve the innovation incentive mechanism, and attract high-level innovative talents and teams. At the same time, strengthen industry-university-research cooperation, promote the deep integration of universities and scientific research institutions with enterprises, and promote the rapid transformation of scientific and technological achievements. The government should introduce targeted support policies to support the development of emerging industries, such as providing financial, policy and technical support to promote economic diversification and high-quality development.

6.3. Future research directions

Although this study reveals the impact of regional innovation capabilities on high-quality economic development in Anhui Province, there are still some limitations. First, the study is mainly based on existing statistical data and literature, and fails to fully cover all possible influencing factors. Second, the time span of the study is limited and fails to fully reflect long-term trends and dynamic changes. Therefore, future research can further expand the data scope and time span, and deeply analyze the dynamic changes of regional innovation capabilities and their long-term impact on economic development. In addition, more moderating variables and mediating effects can be explored to reveal a more complex relationship between innovation capabilities and economic development, and provide more comprehensive theoretical support and empirical basis for policy making.

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