

Research on High Quality Economic Development of Anhui Province Based on ArcGIS

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Abstract

The current stage of China's economic development has changed from the past quantity of growth to quality improvement, the study of high-quality economic development is of great significance. Firstly, based on the interpretation of the connotation of high-quality economic development, the evaluation system of high-quality economic development is constructed from the perspective of structural adjustment. Secondly, using the method of principal component analysis and ArcGIS measure score high quality and economic development of Anhui province to reduce the cities, the results showed that only in the 16 cities in Anhui province, Hefei, Wuhu, Bengbu three cities at a high level of quality and economic development zone in Anhui province, and the remaining thirteen cities, there are seven cities in the medium level area, six cities at a lower level area, therefore, differences in different cities in Anhui province economic development level of high quality and economy in Anhui province high quality overall development level is low. Finally, policies and measures are implemented to promote the upgrading and adjustment of industrial structure, improve the structure of scientific and technological innovation and the structure of green development, so as to promote the high-quality development of Anhui economy.

Keywords

High-quality development; Regional economy; ArcGIS method; Principal component analysis.

1. THE INTRODUCTION

Since reform and opening up, along with our country economy high speed growth, environmental pollution and resource waste, the difference of development expand increasingly prominent problems such as, in the face of the middle-income trap and the increasingly fierce international competition, rely on the low efficiency and low cost of economic growth mode can not meet the need of high quality and economic development in our country, the economic growth mode to improve the urgent nature. The 19th national congress of the communist party of China clearly pointed out that "China's economy has shifted from a stage of rapid growth to a stage of high-quality development".[1]The international economic and trade rules and the global governance system are being rapidly reconstructed. The international political landscape is very unstable. To successfully cope with the century-old changes and firmly seize the initiative, we must promote high-quality economic development and further enhance China's overall national strength and competitiveness.

So how to promote and implement high-quality economic development? In order to answer this question, a set of economic quality evaluation system is constructed, and the panel data of Anhui province is empirically analyzed to explore the level and difference of economic quality

development in different regions, find out the existing problems, and put forward relevant policy Suggestions.

At present, scholars have carried out a lot of researches on high-quality economic development mainly from the two aspects of index system construction and empirical study. In terms of index system construction: Xu Yan (2017) pointed out that in the research on high-quality economic development, it is not only necessary to analyze economic indicators, but also indicators such as people's livelihood, environment and social development.[2]Pan Jiancheng (2017) mainly explored the high-quality development of China's economy from four aspects: innovation, product quality, resource utilization, new growth drivers and efficiency.[3]Li Yumo and Ren Baoping (2018) believe that in addition to economic indicators, ecological environment, infrastructure, health care, social security and education should also be included in the evaluation system.[4]Shi Bo (2018) proposed that high-quality economic development can be analyzed from three dimensions: economic development fundamentals, social achievements, and ecological achievements.[5]

In terms of empirical research: Martin ling and Yan Yingying (2018) constructed the evaluation index model of high-quality economic development from five aspects of economic growth, quality of economic development, power, sustainability and achievements, and evaluated the high-quality development of Ningbo economy and gave policy Suggestions based on innovation-driven development.[6]Shi Bo and Ren Baoping (2018) used the method of equal weight assignment to measure the high-quality development of inter-provincial economy in China, and the results showed that the unbalanced trend of regional economic growth in China was difficult to solve in the short term.[7]Liu Gan and Zheng Siyu (2018) judged the high-quality economic development of 31 provinces and cities in China, and found that there was an obvious imbalance in the quality of their economic development.[8]

To sum up, scholars have conducted a lot of researches on high-quality economic development and achieved certain results. However, most of the existing researches have analyzed the connotation and evaluation system of high-quality economic development from the theoretical perspective, with few empirical studies. In addition, empirical research data are mostly based on national or provincial level, and few studies involve municipal data. Therefore, this paper firstly constructs a set of economic quality evaluation system, and then empirically analyzes the panel data of Anhui province to explore the development level and differences of economic quality in different regions. Finally, the author gives some policy Suggestions to promote the high-quality development of Chinese economy based on the results of theoretical and empirical analysis.

2. CONNOTATION AND EVALUATION SYSTEM OF HIGH-QUALITY ECONOMIC DEVELOPMENT

High-quality economic development should better meet people's growing needs for a better life and better reflect the five development concepts.[9]At the beginning of the reform and opening up, China's weak economic foundation, input and output efficiency is low, the industrial structure, so that the long-term high investment, high consumption of the extensive mode of production, this really in a certain historical stage of China's economic growth provides a huge energy, make our country economic growth of nearly 10% over the past 30 years. However, the current international pattern is changeable, and the internal and external environment have undergone great changes. With the slow recovery of the world economy, the original extensive development model is not enough to support the future high-quality development of China's economy. Therefore, from the Angle of structural adjustment, we should construct the index to measure the high-quality development of economy. In this paper, five grade-level indicators of industrial structure, regional structure, financial structure, energy structure and educational

technology structure are selected to establish a comprehensive evaluation index system for the high-quality economic development of Anhui cities. The selection of indicators is as follows:

(1) Industrial structure. This paper mainly selects the proportion of the tertiary industry added value in GDP and the proportion of the tertiary industry employment as indicators to measure the industrial structure.

(2) Regional structure. In this paper, urbanization rate, urban and rural residents' disposable income ratio, per capita GDP, import and export, fiscal expenditure and agricultural machinery power are selected as indicators to measure the regional structure.

(3) Educational technology structure. In the face of the increasingly fierce international competition, economic growth and qualitative improvement can only be achieved through continuous innovation in various fields, increasing educational investment and improving the overall quality of employees. In particular, scientific and technological innovation is particularly relevant to economic development. This paper measures the structure of regional education technology from the aspects of education and technology. Education indicators include: the number of students in institutions of higher learning and the number of years of education per capita; The number of patent applications is mainly selected as the index of science and technology.

(4) Energy structure. High-quality economic development is also reflected in its health and green. This is also different from the environmental pollution and resource waste caused by the rapid economic growth in the past. In this paper, the proportion of days of air quality reaching the standard, the area of afforestation and the rate of sewage treatment are used to measure the energy structure.

Table 1. Comprehensive evaluation index system of high-quality economic development in Anhui province

Level indicators	The secondary indicators
The industrial structure	Proportion of tertiary industry added value /GDP (unit: %) X1
	Proportion of tertiary industry employment (unit: %) X2
Regional structure	Level of urbanization (unit: %) X3
	Ratio of disposable income of urban and rural residents (unit: %) X4
	GDP per capita (yuan) X5
	Import and export volume (unit: 100 million yuan) X6
	Financial expenditure (unit: 100 million yuan) X7
	Agricultural machinery power (unit: million kw) X8
	Number of students in institutions of higher learning (unit: person) X9
Educational technology structure	Number of patent applications (unit: 1) X10
	Average length of schooling (unit: years) X11
	The proportion of days with air quality reaching the standard (unit: %) X12
The energy structure	Afforestation area (unit: ha) X13
	Sewage treatment rate (unit: %) X14
	Loan amount of financial institutions (unit: 100 million yuan) X15
Financial structure	Deposit amount of financial institutions (unit: 100 million yuan) X16

(5) Financial structure. High-quality economic development in addition to the traditional sense of the real economy, the financial market is gradually playing an increasingly important role, such as the current implementation of inclusive finance, digital finance can well promote regional economic growth and high-quality economic development. This paper measures the improvement of financial structure based on the loan amount of financial institution and the deposit amount of financial institution. The indicators are shown in table 1.

3. MEASURE THE LEVEL OF HIGH-QUALITY ECONOMIC DEVELOPMENT

3.1. Data Source and Method Selection

The original data are from the statistical yearbook of Anhui province and the database of China economic network. Since there may be multicollinearity among indicators, which affects the accuracy of the results, this paper USES principal component analysis to reduce dimension of 16 indicators representing high-quality economic development in Anhui province and eliminate multicollinearity among indicators.[10]

3.2. Measurement Results and Analysis

Because different index units are different, the original data is dimensionalized to eliminate the directivity and dimensionality of the index. Based on principal component analysis of the data in 2017, the scores of each city's high-quality economic development are shown in table 2.

Table 2. Economic quality development scores of Anhui cities and regions

region	Score for high-quality economic development
And fat,	1.77
Huai north city	0.16
Recommend her state,	0.247
Host state,	0.238
Mussel port city	0.43
Mound Yang city	0.296
Huai Nan city	0.21
Chuhe city state	0.34
Six Ann city	0.338
Na An Shan	0.36
Plentiful lake city	0.8
Xuan city	0.304
Copper ling city	0.2
Pool state,	0.25
Ann groundbreaking	0.308
Yellow mountain city	0.292

In order to further analyze the difference of each prefecture level between high quality and economic development in Anhui province, the average partition method is adopted, according to the development of high quality score of high and low degree of using ArcGIS 16 cities in Anhui province is divided into three areas (figure 1, table 3), can be seen from the graph, high quality and economic development in Anhui province overall score low spatial differentiation gap from north to south.[11]

The high level area, with a score greater than or equal to 0.409, was followed by Hefei, Bengbu and Wuhu, accounting for 18.75% of the whole type area. In the middle-level district, the score was greater than 0.273 but less than 0.409, followed by Fuyang city, Chuzhou city, and lu 'an city, accounting for 43.75% of the whole type district. The low-level area, with a score less than or

equal to 0.273, was followed by Huaibei city, Bozhou city, Suzhou city and other 6 cities, accounting for 37.5% of the whole type area. The main reason is that compared with northern and southern Anhui, central Anhui enjoys a superior geographical location, obvious radiation effect of coastal cities, convenient transportation and foreign trade, advanced management experience and innovative technology, and can attract a large number of high-quality talents. In addition, as a provincial city, Hefei's economic development has played a good role in driving the surrounding cities. From the perspective of rational people, the government's policy has been inclined to the central area of Anhui for a long time. Most of the pillar industries in Anhui province are supported by the central part of Anhui province, while the northern and southern parts of Anhui province are dominated by agriculture, with single regional resources, extensive production methods, inadequate infrastructure construction, and backward education and technology, resulting in huge differences in the development level of high-quality economy in different cities in Anhui province.

Table 3. Classification of types of high-quality economic development in Anhui province

High-quality economic development typology	Agv	Involved in city
High level	≥ 0.409	Hefei, Bengbu and Wuhu
Medium level zone	(0.273, 0.409)	Fuyang city, Chuzhou city, Lu 'an city, Maanshan city, Xuancheng city, Anqing city, Huangshan city
The low level area	≤ 0.273	Huaibei city, Bozhou city, Suzhou city, Huainan city, Tongling city, Chizhou city

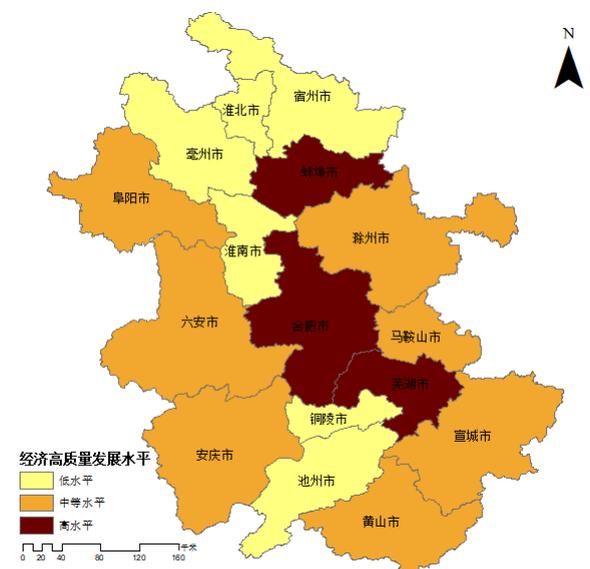


Fig 1. Classification chart of high quality economic development level of each city in Anhui province

4. CONCLUSIONS AND SUGGESTIONS

4.1. The Conclusion

According to the measurement results of high-quality economic development in different regions of Anhui province, only Hefei, Wuhu and Bengbu among the 16 prefectural cities in Anhui province are in the high-level areas of high-quality economic development, while the remaining 13 are in the mid-low level areas. This shows that, according to the industrial

structure, energy structure, education and technology structure and financial structure of indicators construction and measurement, there is still a lot of room to improve the level of high-quality economic development of cities in Anhui province. Therefore, in the process of high-quality economic development of cities in Anhui province, there are problems such as unreasonable industrial structure, lack of green development thinking guidance, green development system to be improved, lack of driving force of scientific and technological innovation, and financial structure to be improved.

4.2. Recommendations

In order to promote the economic development of Anhui province more efficiently, this paper puts forward the corresponding policy Suggestions from the following aspects.

First, we will optimize the industrial structure and promote industrial upgrading. The optimization and upgrading of industrial structure plays a key role in promoting high-quality economic development. On the one hand, we should further clarify the relationship between the leading industry and the auxiliary industry, strengthen the basic construction of the auxiliary industry, and promote the adjustment and optimization of the industrial structure. Through the continuous upgrading and adjustment of industries, we should build a modern industrial system and strategic emerging industries, and enhance the internal driving force and sustainability of high-quality development of regional economy. On the other hand, we will actively guide the primary industry to transform and upgrade to the tertiary industry. Through the improvement of production technology, industrial technology and management concept system to fill the market gap. Actively promoting the integration of Internet and other information technologies with the real economy can not only reduce costs, but also effectively promote the upgrading of regional industrial structure and high-quality economic development.

Second, promote high-quality economic development with green leadership. Establish the green development thinking guidance and improve the green development supervision and governance concept and system to lead the regional economic development of high quality. On the one hand, it is clear that high-quality economic development cannot be separated from green development, and green development is integrated into the process of industrial structure upgrading and adjustment. On the other hand, we should improve the concept system of green development, and adhere to an environmental governance system featuring government leadership, enterprise ownership, public participation and oversight. Improve the environmental red line control system and environmental protection system, and develop the ecological functions of the government; Enterprises should make clear the concept of energy conservation and emission reduction, continue to build the green supply and demand industrial chain through technological innovation and mode innovation, establish the concept of environmental protection and green, and assume the corresponding social responsibility; The public should actively participate in the supervision of environmental protection and actively create a good external atmosphere of green environment, so as to effectively promote the high-quality development of regional economy.

Third, we will promote high-quality economic development through scientific and technological innovation. Scientific and technological innovation is the primary driving force for high-quality economic development. In the new era, scientific and technological innovation is an effective way to solve the traditional development mode featuring high pollution, low productivity and high energy consumption. First, the government should create a favorable external environment for innovation through active policies. Through the salary incentive mechanism to attract high-quality innovative talent influx, to cultivate the enterprise, the public's innovative consciousness and thinking. Second, we will continue to improve innovative concepts and systems, accelerate the government's strategic planning, and formulate plans for leading industries, auxiliary industries and strategic emerging industries. Third, actively

cultivate innovative and entrepreneurial talents. Specifically, we can increase the investment in education, strengthen the construction of innovation and entrepreneurship practice platform in regional colleges and universities, integrate internal and external resources, and form a complete training system for innovation and entrepreneurship talents in theoretical teaching and practical practice, so as to promote the high-quality development of regional economy.

Fourth, we will improve the financial structure and promote high-quality economic development. The high-quality development of economy cannot be separated from the continuous reform and improvement of financial structure, which can be started from the two aspects of improving the depth and availability of financial services, creating a good financial environment and sustainability. On the one hand, efforts should be made to solve the threshold and exclusion effect of traditional financial services, constantly improve the construction of financial infrastructure, improve the uneven distribution of outlets, and make outlets radiate the surrounding blank area of financial services as much as possible. At the same time, accelerate the implementation of innovative financial services, increase the diversification of financial services, develop digital inclusive finance, improve the depth and availability of financial services. On the other hand, we should strengthen the publicity of digital inclusive finance knowledge, foster inclusive finance atmosphere and external environment, and foster and carry forward inclusive finance culture.

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