



Modernization perspective on high-quality regional economic development in Jiangsu province

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Abstract. This study constructs a five-dimensional index system, including economic structure optimization, innovation-driven, environment-friendly, people's life improvement and efficient public services, and uses the entropy method to comprehensively evaluate the regional high-quality development index of Jiangsu Province, so as to provide a comprehensive and scientific policy reference. The system takes into account factors such as economic development, people's life and environmental friendliness, and ensures that the weights are objective and accurate through the entropy method, which provides an accurate basis for evaluating the high-quality development level of various cities. The results of the study will help formulate policies, promote high-quality development in Jiangsu, and provide reference for other regions to promote high-quality development across the country.

Keywords: high-quality development, economic structure optimization, innovation-driven, environment-friendly.

1 Instruction

In the report of the 20th National Congress of the Communist Party of China, General Secretary Xi Jinping stressed that high-quality development is the primary task of comprehensively building a modern socialist country and the essential requirement of Chinese-style modernization. To build a high-quality development measurement system, it is necessary to clarify the core elements and transform them into measurable indicators, which is of great significance to policy practice. The project aims to develop a high-quality development index system based on power statistics by collecting macro, regional and industry level data, and reflecting the high-quality development process of Jiangsu's regional economy. Power data has the advantages of wide coverage, high value density, and strong accuracy, which can truly reflect the development of the national economy and provide an observation perspective for the high-quality development of Jiangsu's regional economy. The power sector needs to use power data

and statistical beacons to achieve precise regulation and control and help the country's high-quality development.

The construction of a high-quality regional development index with Chinese characteristics is aimed at better reflecting the actual development status of China's regional economy. This system is crucial for guiding policy formulation and promoting sustainable and healthy economic development, leading to comprehensive social progress. Internationally, indices such as the United Nations' Human Development Index (HDI)^[1], the World Bank's Doing Business report^[2], and the Organization for Economic Co-operation and Development's (OECD) Quality of Life Index^[3] serve as benchmarks for measuring economic development quality across various dimensions.

These indices typically encompass multiple dimensions, including economic growth, social welfare, environmental sustainability, innovation capacity, education levels, and health standards. However, these indices are not without their limitations. Cultural differences across nations can render certain metrics less applicable, as each country's unique context may not be fully captured by a one-size-fits-all approach. Despite these challenges, there are valuable lessons to be learned from international practices. The integration of multiple dimensions in assessing economic development is essential, as it provides a more nuanced understanding of a region's progress. In crafting a high-quality economic development index system that reflects China's unique circumstances, it is imperative to integrate these international insights while tailoring the system to the nation's specific demographic, resource, and developmental needs. This approach will not only enhance the index's applicability within China but also contribute to its international relevance and comparability, ultimately fostering a more nuanced and accurate assessment of economic development quality.

2 Research design

2.1 Analytical framework of high-quality development index

General Secretary Xi Jinping stressed that the development of the new era needs to implement the new development concept and achieve high-quality development. The Fifth Plenary Session of the 18th Central Committee of the Communist Party of China (CPC) established a new development concept of innovation, coordination, green, openness and sharing. The 2023 Work Report of the Jiangsu Provincial Government emphasizes seeking progress while maintaining stability, fully implementing the new development concept, and promoting high-quality development. Based on the five development concepts and drawing on the relevant evaluation index system, this project constructs a high-quality development evaluation index system including economic structure optimization, innovation-driven, environmental friendliness, people's life improvement, and efficient public services.

There is a rich body of discussion on the connotation of high-quality development, but there is less literature directly exploring its evaluation index system. The existing literature is mainly divided into two categories. One is based on the five development concepts of "innovation, coordination, green, openness, and sharing", and believes that high-quality development is a development that satisfies the people's growing material

and cultural needs. For example, Shi and Li (2019)^[4] constructed a high-quality development index system containing 62 indicators based on these concepts, and measured China's high-quality development index from 2000 to 2017. Xu and Ding (2019)^[5] added the total dimension to these concepts, constructed an index system, and analyzed China's high-quality development index of each province from 1996 to 2016. Zhang et al. (2019)^[6] believe that the core of high-quality development is efficiency, fairness, and sustainability, and constructed a high-quality development index system consisting of 16 indicators. Li et al. (2019)^[7] constructed a high-quality development evaluation index system from five aspects: economic vitality, innovative efficiency, green development, people's livelihoods, and social harmony. Yang and Yang (2019)^[8] constructed a comprehensive index system for high-quality development in the Yangtze River Economic Belt on the basis of Li et al (2019). Zhang (2020)^[9] established a macro-micro integrated high-quality development measurement system by removing the "coordination" dimension and adding two dimensions: "efficiency" and "risk prevention and control" on the basis of the five development concepts.

The second perspective focuses on high-quality economic development from the perspective of high-speed to high-quality transformation. It mainly uses single indicators such as total factor productivity or labor productivity to measure high-quality development. For example, Liu et al. (2019)^[10] used total factor productivity to quantify the level of high-quality development and analyze the effect of innovation-driven high-quality development. He and Shen (2018)^[11] analyzed the impact of a modern economic system on high-quality development from the perspective of total factor productivity. Yu et al. (2019)^[12] used green total factor productivity to measure the high-quality development of the Chinese economy and analyze the economic development reality in different regions. However, economic efficiency mainly reflects the effectiveness of economic development from the perspective of input and output, which is not equivalent to the quality of economic development itself. Therefore, a single indicator measurement may be highly one-sided and difficult to comprehensively, comprehensively and accurately reflect the level of economic development quality.

2.2 Selection of indicators

The five development concepts reveal the core essence of high-quality development, but the specific measurement system, especially the city-level evaluation, needs to elaborate on the theoretical connotation. Following the principles of systematization, effectiveness, comparability, operability and availability, the project constructs an evaluation system for high-quality development in Jiangsu region with a total of 14 indicators in five dimensions, combined with quantitative and qualitative indicators, as shown in Table 1.

Table 1. Index system for high-quality development index

Indicator	Calculation method
(1)Economic structure optimization dimension	
Proportion of service industry	Electricity consumption in the tertiary industry/electricity consumption in the whole industry
Upgrading of industrial structure	Electricity consumption in the tertiary industry/electricity consumption in the secondary industry
Binary Comparison	Electricity Consumption in Agriculture (Primary Industry) / Electricity Consumption in Non-Agriculture (Secondary and Tertiary Industries)
(2)Innovation-driven dimension	
Per capita electricity consumption in advanced manufacturing	Electricity consumption in advanced manufacturing industry per year average resident population
Per capita electricity consumption in high-tech industries	Electricity consumption in high-tech industries/average annual resident population
Per capita electricity consumption in the information technology industry	Electricity consumption in the Internet, software and information technology services industry/average permanent resident population per year
Per capita electricity consumption for R&D and innovation	Electricity consumption for scientific research and technical services/average annual permanent population
(3)Environment-friendly dimension	
Electricity efficiency	The ratio of gross domestic product to the electricity consumption of the whole society
Clean energy generation per capita	Clean energy power generation per year average resident population
Proportion of electricity consumption in non-polluting industries	1-electricity consumption in polluting industries/electricity consumption in the whole industry
(4)People's life improvement dimension	
Per capita electricity consumption for spiritual civilization	Electricity consumption for culture, sports and recreation/annual average permanent population
Per capita electricity consumption for material civilization	Electricity consumption for accommodation and catering industry/average annual permanent resident population
(5)Efficient public service dimension	
Per capita electricity consumption for public services	Electricity consumption for public services/annual average permanent population
Infrastructure electricity per capita	Infrastructure electricity per capita per year per resident population

2.3 Sample selection and data sources

Taking each prefecture-level city in Jiangsu Province as the research object, taking 2013 to 2023 as the sample range, the electricity consumption of the whole industry, as well as the annual GDP data and population data of each prefecture-level city were

collected, and the above indicators were calculated. In the administrative planning of Jiangsu Province, the province is divided into three regions: southern Jiangsu, central Jiangsu and northern Jiangsu according to various factors such as geographical location and economic development. The industry electricity consumption data comes from State Grid Jiangsu Electric Power Co., Ltd., and the GDP data and population data of prefecture-level cities come from the Jiangsu Provincial Statistical Yearbook.

3 Calculation of high-quality development index

3.1 Measurement method

The weight assignment methods commonly used in academia are divided into subjective evaluation method and objective evaluation method. Subjective methods, such as analytic hierarchy process, have a large role for experts but are highly subjective. Objective methods such as factor analysis, principal component analysis, and entropy analysis. The entropy value method judges the importance according to the discrete degree of index data, avoids human interference, and objectively reflects the importance of indicators in the evaluation system. In order to make the evaluation results objective, the combined weighting method was adopted, and the index weights were determined by combining the analytic hierarchy process and the entropy value method.

3.2 Calculation results

Table 2 shows the estimated values of Jiangsu’s regional high-quality development index from 2013 to 2022.

Table 2. Estimated value of Jiangsu high-quality development index from 2013 to 2022

District	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Jiangsu	0.211	0.213	0.213	0.216	0.219	0.218	0.216	0.222	0.230	0.244
Nanjing	0.716	0.724	0.726	0.726	0.725	0.722	0.720	0.721	0.718	0.723
Suzhou	0.353	0.359	0.336	0.348	0.332	0.315	0.325	0.330	0.364	0.373
Changzhou	0.193	0.188	0.185	0.176	0.185	0.184	0.185	0.196	0.205	0.224
Wuxi	0.299	0.291	0.281	0.307	0.299	0.277	0.275	0.266	0.269	0.274
Zhenjiang	0.221	0.232	0.226	0.220	0.216	0.213	0.209	0.214	0.201	0.204
Yangzhou	0.152	0.141	0.139	0.154	0.153	0.150	0.150	0.150	0.162	0.195
Nantong	0.144	0.144	0.144	0.148	0.145	0.141	0.133	0.165	0.201	0.222
Taizhou	0.102	0.101	0.107	0.113	0.109	0.109	0.100	0.111	0.109	0.110
Xuzhou	0.065	0.083	0.104	0.091	0.104	0.137	0.123	0.128	0.128	0.134
Lianyungang	0.251	0.237	0.231	0.239	0.235	0.255	0.258	0.241	0.237	0.226
Huaian	0.097	0.105	0.123	0.125	0.133	0.126	0.129	0.162	0.141	0.147
Yancheng	0.060	0.069	0.078	0.097	0.129	0.129	0.126	0.135	0.172	0.222
Suqian	0.084	0.091	0.095	0.066	0.083	0.078	0.078	0.073	0.082	0.116

As shown in Table 2, from 2013 to 2022, the fluctuation of Jiangsu’s regional high-quality development index showed an upward trend. Specifically, the index value

increased from 0.211 in 2013 to 0.244 in 2022. Among them, the high-quality development index in southern Jiangsu is relatively high, while the high-quality development index in central and northern Jiangsu is relatively low. The development index of Yangzhou and Nantong is higher than that of central Jiangsu, while that of Taizhou is relatively low. Lianyungang City has a higher development index in northern Jiangsu, while Suqian City has a relatively low development index.

3.3 Measurement results of five dimensions

The overall development of Jiangsu Province is relatively good, and the change trend of the measured results of each dimension is shown in Figure 1.

As can be seen from Figure 1, Jiangsu Province has made some progress in economic structure optimization, specifically, the economic structure optimization index has increased from 0.0375 in 2013 to 0.0465 in 2022, showing a gradual improvement trend. The Innovation Driven Index has remained at a stable high level. The performance of the index of people's living standards and efficient public services is relatively stable, and the data has not fluctuated much over the years. The environmental friendliness index basically remained stable, with no obvious upward or downward trend, maintaining a slow growth trend.

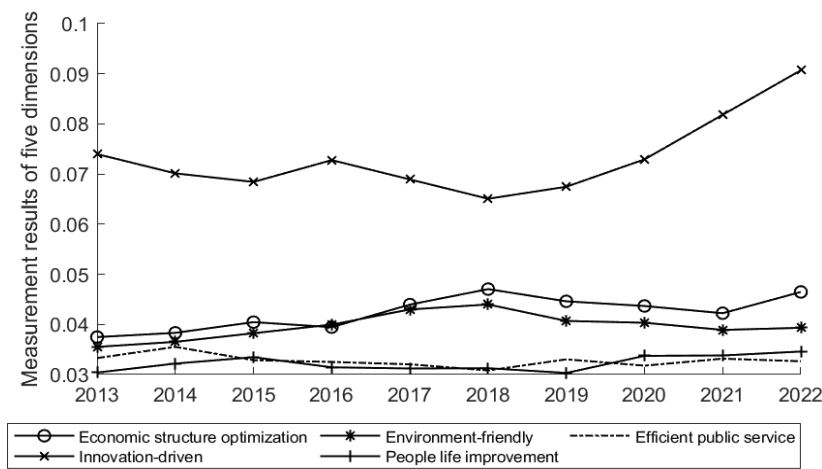


Fig. 1. Measurement results of five dimensions of high-quality development in Jiangsu Province from 2013 to 2022

4 Conclusion

Jiangsu Province has advanced remarkably in terms of superior development. Statistical measures of economic structure optimization, inventiveness, and effective public services have all improved, but more work has to be done to better people's lives and the environment. In particular, while things have improved overall, traditional industries are still under pressure to change and modernize, and the emergence of new in-

dustries might not have had enough of a scale effect to warrant economic structure optimization. Jiangsu Province performs well overall in terms of innovation drive because of ongoing investments in talent introduction and technology innovation. But increasing a region's capacity for creativity takes time and money, and it cannot be achieved overnight. To maintain effective environmental preservation while promoting economic development, Jiangsu Province must step up ecological construction and environmental protection efforts. Jiangsu Province's overall performance in terms of bettering people's lives is consistent, although it may yet be improved. Comprehensive changes in the areas of work, healthcare, education, and other areas are necessary to raise people's living standards. Jiangsu Province has made great strides toward more effective public services through the use of information technology and raising the caliber of government services. Nonetheless, there is still a need for increased public service supply optimization as well as enhanced service efficiency and quality.

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