ISSN: 2692-7608 DOI: 10.6981/FEM.202601_7(1).0013

Research on Measuring New Quality Productivity: A Case Study of the Yangtze River Delta Region

Chuanyang Chen*

School of Economics, Anhui University of Finance and Economics, Bengbu, China

*1574070758@qq.com

Abstract

To assess the development level of new-quality productive forces (NQPF) in the Yangtze River Delta, this study constructs a "goal-subject-carrier" three-dimensional evaluation system and measures NQPF using the entropy weight method based on prefecture-level data from 2014 to 2023. Results indicate that NQPF in the region has grown steadily (with the average comprehensive index increasing by over 260% in a decade) but shows significant spatial differentiation, forming a gradient pattern led by Shanghai, Suzhou, and Hangzhou. High-level NQPF depends on the systematic matching of factor upgrading, multi-subject collaboration, and industrial upgrading. The research provides policy references for promoting the integrated high-quality development of NQPF in the region.

Keywords

New-quality Productive Forces (NQPF); Yangtze River Delta Region; Measurement; Three-dimensional Index System; Spatiotemporal Differentiation.

1. Introduction

On September 7, 2023, General Secretary Xi Jinping first put forward the concept of new quality productive forces at the Symposium on Promoting the All-round Revitalization of Northeast China in the New Era. Since then, General Secretary Xi Jinping has elaborated further on this concept. Regarding the questions of what new quality productive forces are and how to develop them, General Secretary Xi Jinping pointed out: "New quality productive forces represent an advanced form of productive forces dominated by innovation, which breaks away from traditional economic growth models and paths of productivity development, featuring high technology, high efficiency, and high quality, and conforming to the new development philosophy. It is spawned by revolutionary breakthroughs in technology, innovative allocation of production factors, and in-depth transformation and upgrading of industries. Its basic connotation lies in the upgrading of laborers, means of labor, objects of labor, and their optimized combination, with a substantial increase in total factor productivity as its core symbol. Its defining characteristic is innovation, its key lies in high quality, and its essence is advanced productive forces." New quality productive forces constitute the latest achievement in adapting Marxist theories on productive forces to the Chinese context and serve as a crucial means for comprehensively building a modern socialist country. This paper scientifically measures the development level of new quality productive forces in the Yangtze River Delta, analyzes its spatial-temporal evolution characteristics and influencing factors. From the perspective of system theory, it constructs a three-dimensional evaluation system of "Goal-Subject-Carrier" and conducts the measurement using the entropy weight method. The final results provide a quantifiable and comparable analytical framework for the development of new quality productive forces in the Yangtze River Delta, which holds policy reference value for promoting the integrated and high-quality development of the Yangtze River Delta region.

Since its proposal, new quality productive forces and related research have rapidly emerged as a focal topic in the field of economic studies. In terms of research focuses, existing literature covers aspects such as the scientific connotation and current - situation measurement of new quality productive forces. For instance, regarding the scientific connotation, Justin Yifu Lin argues that new quality productive forces constitute a dynamic concept with temporal and spatial attributes, serving as a systematic theory guiding high - quality development[1]. Huang Qunhui links new quality productive forces to the new development philosophy and explains why new quality productive forces are inherently green productive forces[2]. Ling Xiaoxiong interprets new quality productive forces as the productive forces that lead strategic emerging industries and future industries[3]. From the perspective of the interaction between productive forces and production relations, Liu Wei puts forward strategic suggestions on constructing a new type of production relations and promoting the development of new quality productive forces, which strongly demonstrates that discussions related to new quality productive forces are a concrete manifestation of the latest progress in the contemporary Chinese practice of Marxism[4].

In terms of the logical context of its proposal, Ren Baoping holds that new quality productive forces represent a leap in productive forces[5]. Gao Fan suggests dividing the new quality productive forces system into four components: goals, carriers, subjects, and guarantee mechanisms. The goal is to enhance total factor productivity driven by the leap in factor supply and the leap in the combination of factor supply; the modern industrial system serves as the carrier; the new government - market relationship acts as the subject; and the new type of production relations functions as the guarantee mechanism[6].

In the context of China's practical significance in comprehensively building a great modern socialist country and achieving high - quality development, existing literature emphasizes that developing new quality productive forces helps advance the modernization of the industrial chain[7], boost high -- quality regional development[8], strengthen national competitive advantages[9], promote common prosperity[10], and advance high - quality economic and social development from both the supply and demand sides[11].

Existing studies have also explored new quality productive forces from the perspectives of indicator design and progress measurement. Most scholars start from the three traditional elements of the labor process and closely follow General Secretary Xi Jinping's important exposition that the basic connotation of new quality productive forces lies in the upgrading of laborers, means of labor, objects of labor, and their optimized combination to construct indicator systems. For example, Wang Jue builds a comprehensive evaluation indicator system for new quality productive forces from three dimensions-laborers, objects of labor, and means of production-based on the principle of long - term requirements for new quality productive forces[12]. Some other researchers list the upgrading of optimized combinations[13] and new quality production outcomes[14] as independent first - level indicators, which are juxtaposed with laborers, objects of labor, and means of production in the construction of the indicator system.

Overall, the academic community has accumulated abundant achievements in the connotation interpretation and comprehensive measurement of new quality productive forces, laying a solid theoretical foundation for this study. Nevertheless, existing research still has the following limitations. Firstly, most studies focus on the overall level evaluation or single - dimension analysis of new quality productive forces, lacking an investigation into the interactions among various dimensions and their overall impact on the formation of new quality productive forces from the perspective of a synergistic and interconnected systematic framework. Secondly, existing research mostly focuses on the static measurement or spatial - temporal comparison of development levels, with relatively insufficient discussions on the matching of internal elements and the coordination of structures within the system. Therefore, based on systems

ISSN: 2692-7608 DOI: 10.6981/FEM.202601_7(1).0013

thinking, this paper constructs a comprehensive evaluation system for new quality productive forces from three dimensions-goals, subjects, and carriers, highlighting the correlation and integrity of all components of the system.

2. The Construction of a Theoretical Framework for the Measurement of New Quality Productive Forces

2.1. Logical Analysis of the Systematic Theory of New Quality Productive Forces

Demand From the perspective of system theory, the formation and development of new quality productive forces (NQPF) constitute a systematic leap process in which multiple dimensions-including goals, subjects, and carriers-are mutually embedded and synergistically interact. This process must not only follow the inherent laws of productivity development but also align with the practical needs of China's modernization drive. Through the optimal combination of internal elements within each dimension and the dynamic adaptation between dimensions, an overall upgrade of the qualitative state of productivity is achieved.

From the goal dimension, the core objective of NQPF development is to realize a substantial increase in total factor productivity (TFP). The attainment of this goal relies on the dual support of leaps in factor supply and leaps in factor combination modes. According to Marxist political economy theory, the development of productivity depends not only on the supply of production factors but also on their social combination mode, i.e., the efficiency of factor allocation. The key distinction between NQPF and traditional productivity lies in the introduction of new production factors such as data. Leveraging data's strong penetrability, cross-cutting nature, and integration capability, NQPF drives systemic changes in the combination modes of other factors, generating an efficiency improvement effect. This transformation of factor combination modes is not a simple adjustment of the proportional relationship between factors; instead, it represents a shift from the traditional reliance on increased input of tangible factors to efficiency optimization driven by intangible factors such as technological innovation and organizational reform.

From the subject dimension, the cultivation of NQPF involves the collaborative participation of multiple subjects, forming a systematic government-market framework. Market subjects include enterprises and residents, which drive productivity transformation from the supply and demand sides, respectively. As the micro-units of national production and the core entities of technological and industrial innovation, enterprises of different ownership types assume differentiated yet complementary roles in NQPF development. State-owned enterprises (SOEs), by virtue of their advantages in capital, technology, and talent, can leverage the new nationwide system to conduct original and disruptive technological research in key fields such as chip manufacturing, aerospace, and new energy, exerting the institutional advantage of concentrating resources on major undertakings. Private enterprises, with their flexible mechanisms and high market sensitivity, demonstrate greater vitality in nurturing emerging industries and innovating business models. For example, in the digital economy sector, private enterprises have rapidly emerged in niche areas such as e-commerce, mobile payment, and artificial intelligence applications, becoming important forces driving the digital transformation of industries. As the main body of market demand, residents' consumption structure upgrading provides a crucial driving force for NQPF development. With the entry of socialism with Chinese characteristics into a new era, residents' demand for personalized, experiential, and green consumption has grown significantly. This transformation of consumption demand not only directly drives the upgrading of consumer goods industries (e.g., the rapid development of smart home industries) but also forces enterprises to increase R&D investment and improve production technology and product quality through the mechanism of

ISSN: 2692-7608 DOI: 10.6981/FEM.202601_7(1).0013

demand-driven supply, forming a positive cycle of consumption-innovation-production. For instance, residents' demand for longer driving ranges of new energy vehicles (NEVs) has prompted automakers to accelerate the technological iteration of NEVs, thereby driving the green transformation of the entire industrial chain. The government plays multiple roles as a guide, guarantor, and coordinator in NQPF development. Its functions must be effectively coordinated with market mechanisms rather than replacing the market. At the macro level, the central government provides strategic guidance and institutional guarantees for NQPF development by formulating national development plans and improving industrial policies. For example, in the field of technological innovation, the central government promotes the integration of cross-departmental and cross-regional scientific research resources to address bottleneck technologies. In the industrial sector, it guides resource agglomeration toward strategic emerging industries and future industries through tax incentives and financial subsidies, accelerating the optimization and upgrading of the industrial structure. At the local level, local governments advance NQPF development in light of regional resource endowments and industrial foundations. Eastern China, relying on its solid economic foundation and concentration of scientific and technological talents, focuses on developing high-tech industries such as the digital economy, biomedicine, and high-end equipment manufacturing. Central and western China, meanwhile, leverages local characteristic resources to drive the digital transformation of traditional industries and foster distinctive emerging industries. For example, Guizhou has built a national-level big data comprehensive pilot zone based on its big data industry foundation, while energy-rich provinces such as Shanxi and Shaanxi are accelerating the clean and efficient utilization of coal and developing new energy industries, realizing the transformation from a resource-based economy to an innovation-driven economy. This central-local coordination not only ensures the unity and integrity of national strategies but also fully stimulates local innovation vitality, avoiding efficiency losses caused by a one-size-fits-all development model.

From the carrier dimension, industries serve as the important carriers of NQPF. Building a modern industrial system requires the coordinated development of traditional, emerging, and future industries, forming a systematic pattern of "stock optimization, incremental expansion, and future layout." As the foundation of the national economy, the transformation and upgrading of traditional industries provide crucial support for NQPF development. Against the backdrop of the new round of technological revolution, traditional industries are transforming toward intelligent and green manufacturing through the in-depth integration of digital technologies. This transformation not only extends the life cycle of traditional industries but also provides market space and supporting facilities for emerging industries. For example, the digital transformation of traditional manufacturing has driven the development of industrial software and intelligent sensor industries. Strategic emerging industries are the growth engines of NQPF development, and their progress depends on the dual drive of technological innovation and market demand. Characterized by high technology and knowledge intensity, these industries cover cutting-edge fields such as the next-generation information technology, high-end equipment manufacturing, new energy, new materials, and biomedicine. They build a complete industrial ecosystem through upstream-downstream collaborative innovation. Meanwhile, the development of strategic emerging industries must focus on integration with traditional industries. For instance, the growth of the NEV industry has driven technological upgrading in traditional auto parts enterprises, promoting the technological transformation of the traditional automotive industry and forming a coordinated development pattern of "emerging industries leading and traditional industries supporting." Future industries are the strategic high ground of NQPF development. Their layout must focus on the cutting-edge trends of technological revolution and industrial transformation, with forward-looking planning and targeted efforts to reserve space for future productivity development. The cultivation of future

ISSN: 2692-7608 DOI: 10.6981/FEM.202601_7(1).0013

industries is characterized by high risk and long cycles, making it difficult to form spontaneously through market mechanisms alone. It thus requires collaborative efforts between the government and the market. At the government level, policy support and institutional guarantees for future industries are provided through measures such as improving the intellectual property protection system. At the market level, enterprises are encouraged to establish long-term cooperation with research institutions, increase investment in basic research, and explore the industrialization path of cutting-edge technologies. The layout of future industries should not blindly pursue novelty but must align with national strategic needs, technological development levels, and potential market demand. This avoids the misconception of layout for layout's sake and ensures that future industries can truly become a long-term driving force for NQPF development.

From the perspective of system synergy, industrial carriers maintain close interactive relationships with the goal and subject dimensions. On the one hand, the optimization and upgrading of the industrial system provide support for goal achievement: the transformation of traditional industries improves the utilization efficiency of stock factors; the cultivation of emerging industries expands the supply scale of high-efficiency factors; and the layout of future industries reserves space for the reform of factor combination modes. Together, these three aspects drive the improvement of TFP. On the other hand, the synergy of various subjects provides momentum for the upgrading of industrial carriers—government policy guidance and resource support create a favorable environment for industrial development; corporate innovation activities drive industrial technological progress and business model innovation; and residents' consumption demand provides market support for industrial growth.

2.2. Construction of the Indicator System

In summary, this paper constructs an evaluation indicator system from three dimensions-development goal, carrier, and subject of the systematic development of new quality productive forces (NQPF)-to comprehensively measure the overall performance of the Yangtze River Delta (YRD) region in NQPF development.

First, from the development goal dimension, NQPF emphasizes the upgrading of factors and the upgrading of their optimized combination. Regarding factor upgrading, three indicators are selected: full-time equivalent of R&D personnel in industrial enterprises above designated size, integrated circuit output, and total telecommunication business volume. These indicators correspond to the upgrading of laborers, objects of labor, and means of labor from three perspectives--R&D human input, core industry production capacity, and information infrastructure level--respectively, reflecting factor upgrading in NQPF development. Among them, the full-time equivalent of R&D personnel in industrial enterprises above designated size can effectively measure the "new laborers" that meet the theoretical requirements of NQPF. Integrated circuit output represents the production result of new means of labor acting directly on new objects of labor, while data--the most important new means of labor-is proxied by the total telecommunication business volume indicator. Under the socialist market economic system, wealth and use value still take the form of commodity money; factors are commodities, and the wealth created by their combination is expressed as the total price. Improvements in factor efficiency and total factor productivity (TFP) are reflected not only in higher concrete labor efficiency but also in the growth of total price and output level. Therefore, for the upgrading of factor combination, per capita regional GDP is chosen as a comprehensive indicator to reflect the economic development effects brought by the coordinated allocation of factors.

Second, from the development subject dimension, the driving forces of NQPF include two major subjects: the market (composed of residents and enterprises) and the government. For market subjects, three indicators are set: average number of computers per 100 households at the end

ISSN: 2692-7608 DOI: 10.6981/FEM.202601_7(1).0013

of the year, number of undergraduate graduates (including completers) from ordinary institutions of higher education (10,000 persons), and number of internet broadband access ports (10,000 units). These indicators characterize the popularity of digital devices among residents, the supply capacity of high-quality labor, and the accessibility of digital services, respectively. Meanwhile, the proportion of enterprises with e-commerce transaction activities (%) and the number of artificial intelligence enterprises are selected to reflect the digital transformation of enterprises and the vitality of market participation. For government subjects, the proportion of fiscal expenditure on science and technology is used as a proxy indicator to reflect the government's guiding role in nurturing emerging industries and supporting technological innovation.

Table 1. Indicator System for Measuring the Development Level of New Quality Productive Forces

First-level Indicators	Second-level Indicators	Third-level Indicators	Attribute
Target	Factor Upgrade	Full-time Equivalent of R&D Personnel in Industrial Enterprises Above Designated Size	+
		Integrated Circuit Output	+
		Total Telecom Business Volume	+
	Optimal Combination Upgrade	Regional Per Capita GDP	+
		Number of Computers Owned per 100 Households at Year-end	+
Subject	Residents	Number of Undergraduate Graduates (including completers) from Regular Institutions of Higher Education (10,000 people)	+
		Number of Internet Broadband Access Ports (10,000 ports)	+
	Enterprises	Proportion of Enterprises with E-commerce Transaction Activities (%)	+
		Number of Artificial Intelligence Enterprises	+
	Government	Proportion of Fiscal Expenditure on Science and Technology	+
		Optical Cable Length / Regional Area	+
Carrier	Transforming Traditional Industries	Number of Granted Utility Model Patent Applications	+
		Density of Industrial Robot Installations	+
	Fostering Emerging Industries	Software Business Revenue	+
		Number of New Product Development Projects of Industrial Enterprises Above Designated Size	+
	Layout of Future Industries	Turnover of Technology Market	+

Third, from the development carrier dimension, industries are the core carriers of NQPF, which require the coordinated advancement of traditional industry transformation, emerging industry cultivation, and future industry layout. For the transformation and upgrading of traditional industries, three indicators are introduced: length of optical cable lines per unit area, number of granted utility model patent applications, and installation density of industrial robots. These indicators measure the effectiveness of traditional industry transformation and

ISSN: 2692-7608 DOI: 10.6981/FEM.202601_7(1).0013

upgrading from the perspectives of infrastructure support, technological achievement transformation, and the intelligent level of production equipment, respectively. For the cultivation and expansion of emerging industries, software business revenue and number of new product development projects of industrial enterprises above designated size are selected to reflect the scale of the digital industry and the vitality of enterprise innovation activities. For the layout and construction of future industries, total turnover of the technology market is set to reflect the technological reserve capacity for future industry development.

In conclusion, this paper constructs an evaluation system consisting of 16 core indicators from the three dimensions of development goal, development subject, and development carrier (see Table 1 for details). This system systematically depicts the comprehensive performance of NQPF in terms of factor allocation, subject behavior, and industrial foundation, providing a theoretical basis and data support for subsequent empirical measurement and policy analysis.

2.3. Data Sources

Due to data availability constraints, this paper selects data from the Yangtze River Delta region covering the period 2014-2023 for analysis. The data are sourced from the official websites of municipal statistical bureaus, as well as the China Statistical Yearbook, China Science and Technology Statistical Yearbook, China Energy Statistical Yearbook, China Industrial Statistical Yearbook, and China Labor Statistical Yearbook. A small number of missing data points are supplemented using the linear interpolation method.

3. Empirical Analysis

The data in Table 2 show that the development of new quality productive forces (NQPF) in the Yangtze River Delta (YRD) region from 2014 to 2023 exhibited significant characteristics of spatial differentiation and temporal evolution. Except for Shanghai, Jiangsu Province demonstrated the most outstanding overall performance during the observation period, with the average development level of its 13 prefecture-level cities significantly leading the region. Zhejiang Province presented a rapid catch-up trend with Hangzhou and Ningbo as its dual cores. As a directly administered municipality, Shanghai possessed unique advantages in the density of innovative factors and institutional efficiency. Although Anhui Province had a relatively weak foundation, key cities represented by Hefei showed strong growth potential. This spatial distribution pattern of NQPF reflects the combined effects of economic development foundations, innovative resource endowments, and policy driving forces. At the city level, first-tier cities represented by Shanghai, Suzhou, and Hangzhou constituted the core growth poles of regional NQPF development. These cities maintained high levels of performance in core indicators such as the full-time equivalent of R&D personnel in industrial enterprises above designated size, software business revenue, and total turnover of the technology market. Second-tier cities including Nanjing, Ningbo, Wuxi, and Hefei achieved remarkable progress in nurturing emerging industries and transforming traditional industries. Most third-tier cities (with an index ranging from 0.15 to 0.29) were in a critical stage of factor accumulation and industrial transformation. Notably, although fourth-tier cities such as Suqian, Lishui, and Chizhou maintained growth, the absolute gap with leading cities continued to widen.

An in-depth analysis from the temporal dimension reveals differentiated development trajectories among various cities. Shanghai's development curve exhibited a two-stage characteristic of "steady growth - accelerated leap", with a significant breakthrough achieved particularly in 2021, which was closely linked to its strategic deployment of strengthening the construction of an international science and technology innovation center. Cities such as Suzhou and Hangzhou demonstrated a more sustained and stable growth trend, with annual growth rates maintained at a relatively balanced level, reflecting the resilience of their industrial systems and the maturity of their innovation ecosystems. Hefei's development

ISSN: 2692-7608 DOI: 10.6981/FEM.202601_7(1).0013

trajectory is particularly noteworthy: its NQPF development level index surged from 0.17 in 2014 to 0.34 in 2023, achieving a doubling growth. The growth rate accelerated significantly especially after 2016, which highly coincided with the implementation of major initiatives such as the construction of a national comprehensive science center and the layout of strategic emerging industries. In contrast, some traditional industrial cities and resource-based cities in the region experienced relatively slow growth. For example, although cities like Xuzhou and Wenzhou achieved growth, their growth rates were significantly lower than the regional average. Cities such as Tongling and Huangshan lingered at a low level for a long time, reflecting the deep-seated challenges faced in industrial transformation and upgrading.

Table 2. Comprehensive Index for Measuring the Development Level of New Quality Productive Forces in the Yangtze River Delta Region (2014–2023)

Province	City	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Shanghai	Shanghai	0.59	0.58	0.6	0.63	0.67	0.7	0.72	0.82	0.8	0.87
Jiangsu	Nanjing	0.24	0.25	0.27	0.29	0.3	0.33	0.35	0.41	0.43	0.44
Jiangsu	Nantong	0.17	0.18	0.19	0.2	0.2	0.18	0.19	0.24	0.23	0.25
Jiangsu	Suqian	0.09	0.09	0.09	0.09	0.09	0.11	0.11	0.12	0.12	0.13
Jiangsu	Changzhou	0.16	0.16	0.17	0.18	0.19	0.18	0.18	0.22	0.23	0.26
Jiangsu	Xuzhou	0.15	0.16	0.18	0.18	0.16	0.18	0.19	0.22	0.22	0.23
Jiangsu	Yangzhou	0.11	0.12	0.13	0.13	0.13	0.12	0.12	0.14	0.14	0.15
Jiangsu	Wuxi	0.2	0.2	0.22	0.23	0.25	0.25	0.25	0.29	0.3	0.33
Jiangsu	Taizhou	0.1	0.11	0.12	0.13	0.12	0.12	0.12	0.14	0.14	0.15
Jiangsu	Huai'an	0.08	0.09	0.09	0.1	0.09	0.1	0.1	0.12	0.11	0.13
Jiangsu	Yancheng	0.11	0.12	0.13	0.13	0.13	0.13	0.13	0.15	0.15	0.17
Jiangsu	Suzhou	0.32	0.32	0.35	0.38	0.39	0.41	0.43	0.49	0.5	0.54
Jiangsu	Lianyungang	0.09	0.09	0.1	0.11	0.1	0.11	0.11	0.13	0.12	0.13
Jiangsu	Zhenjiang	0.12	0.12	0.13	0.13	0.12	0.12	0.12	0.13	0.13	0.14
Zhejiang	Lishui	0.07	0.07	0.07	0.07	0.07	0.08	0.07	0.08	0.08	0.09
Zhejiang	Taizhou	0.12	0.12	0.13	0.15	0.16	0.17	0.17	0.2	0.18	0.19
Zhejiang	Jiaxing	0.13	0.13	0.15	0.16	0.17	0.17	0.18	0.2	0.19	0.21
Zhejiang	Ningbo	0.22	0.23	0.25	0.27	0.28	0.29	0.3	0.35	0.35	0.36
Zhejiang	Hangzhou	0.28	0.3	0.32	0.34	0.35	0.37	0.41	0.47	0.5	0.53
Zhejiang	Wenzhou	0.15	0.16	0.17	0.18	0.19	0.2	0.22	0.23	0.22	0.24
Zhejiang	Huzhou	0.11	0.11	0.12	0.12	0.13	0.13	0.13	0.15	0.15	0.16
Zhejiang	Shaoxing	0.14	0.14	0.15	0.17	0.17	0.18	0.18	0.2	0.19	0.2
Zhejiang	Zhoushan	0.06	0.06	0.07	0.07	0.07	0.08	0.09	0.1	0.1	0.11
Zhejiang	Quzhou	0.07	0.07	0.07	0.08	0.09	0.09	0.08	0.1	0.09	0.1
Zhejiang	Jinhua	0.13	0.13	0.14	0.14	0.16	0.16	0.16	0.17	0.16	0.17
Anhui	Bozhou	0.07	0.08	0.08	0.1	0.1	0.1	0.09	0.11	0.11	0.13
Anhui	Lu'an	0.08	0.08	0.07	0.08	0.09	0.1	0.1	0.12	0.11	0.12
Anhui	Hefei	0.17	0.18	0.21	0.21	0.23	0.26	0.28	0.32	0.33	0.34
Anhui	Anqing	0.09	0.08	0.08	0.09	0.09	0.09	0.09	0.1	0.09	0.1
Anhui	Xuancheng	0.07	0.07	0.07	0.08	0.08	0.09	0.08	0.1	0.09	0.09
Anhui	Suzhou	0.08	0.08	0.08	0.09	0.1	0.09	0.09	0.11	0.1	0.12
Anhui	Chizhou	0.04	0.05	0.04	0.05	0.05	0.06	0.06	0.07	0.06	0.06
Anhui	Huaibei	0.06	0.05	0.06	0.06	0.06	0.06	0.07	0.08	0.08	0.09
Anhui	Huainan	0.04	0.05	0.06	0.07	0.07	0.07	0.07	0.08	0.07	0.08
Anhui	Chuzhou	0.09	0.09	0.1	0.1	0.12	0.11	0.11	0.13	0.13	0.14
Anhui	Wuhu	0.12	0.12	0.14	0.14	0.15	0.14	0.15	0.18	0.16	0.17
Anhui	Bengbu	0.09	0.09	0.1	0.1	0.1	0.1	0.1	0.1	0.12	0.13
Anhui	Tongling	0.08	0.07	0.07	0.07	0.07	0.05	0.07	0.08	0.08	0.08
Anhui	Fuyang	0.1	0.11	0.1	0.12	0.13	0.13	0.13	0.15	0.14	0.15
Anhui	Ma'anshan	0.07	0.07	0.08	0.09	0.1	0.09	0.1	0.11	0.09	0.1
Anhui	Huangshan	0.05	0.04	0.05	0.05	0.06	0.06	0.05	0.06	0.05	0.06

ISSN: 2692-7608 DOI: 10.6981/FEM.202601_7(1).0013

4. Conclusion

This paper employs the entropy weight method to measure and analyze the development level of NQPF in the YRD region from 2014 to 2023. The main findings are as follows: First, the overall NQPF in the YRD region showed a sustained growth trend, with the average value of the regional comprehensive index increasing by more than 260% over the decade. However, significant spatial differentiation exists, forming a development pattern with Shanghai, Suzhou, and Hangzhou as the core growth poles, Nanjing, Ningbo, Hefei and other cities as a strong second tier, and a multi-level gradient development structure. Second, the development of high-level NQPF relies on the systematic matching of the three dimensions of goal, subject, and carrier. Leading cities have formed synergistic advantages in indicators such as R&D human resource density, digital infrastructure, and industrial intelligence, while late-developing cities often face structural shortcomings.

Based on the research conclusions, this paper puts forward the following policy recommendations: First, construct a new pattern of gradient-coordinated regional development, implement differentiated regional strategies, and establish an integrated system of "core leadership - axis-belt radiation - circle-layer linkage". First-tier cities such as Shanghai, Suzhou, and Hangzhou should focus on the allocation of innovative resources and breakthroughs in cutting-edge technologies, and build large-scale innovation bases. Second-tier cities including Nanjing, Ningbo, and Hefei should strengthen the cultivation of industrial clusters, build national-level industrial highlands in fields such as artificial intelligence and biomedicine, and play the role of regional radiation hubs. For third and fourth-tier cities, the focus should be on integrating into the regional innovation network through industrial supporting and digital connection. Second, implement a three-dimensional linkage system upgrading project. To address the bottleneck of factor quality in the goal dimension, launch a "New Laborer" training program, cultivate compound digital talents relying on high-level universities and new-type research institutions, and establish a YRD high-end talent sharing pool. To tackle the insufficient coordination in the subject dimension, deepen comprehensive reforms, improve the "challenge-based bidding" mechanism for private enterprises to participate in major scientific and technological projects, and transform fiscal science and technology investment from supporting projects to nurturing innovation ecosystems. To overcome the transformation dilemma in the carrier dimension, launch the "Digital-Real Integration Deep Blue Plan", set up special funds for the intelligent transformation of traditional industries, and promote the "Industrial Brain + Future Factory" model. Formulate a YRD future industry map, establish an industrial layout coordination mechanism, and avoid homogeneous competition. It is recommended to build NQPF innovation and development pilot zones in cities such as Suzhou and Hefei, and carry out pilot projects of policy integration and innovation. Third, improve the innovation ecosystem. Take institutional opening-up as a key breakthrough, and take the lead in aligning with international high-standard rules in areas such as cross-border data flow and intellectual property protection. Cultivate professional science and technology service institutions, and build a YRD science and technology resource sharing platform. Establish a fault-tolerant mechanism for innovation failures, and create an innovation culture that encourages exploration. Take green and low-carbon development as a hard constraint, formulate green evaluation standards for NQPF, and develop a circular economy.

References

[1] Lin Y F. Accelerating the Development of New Quality Productive Forces: A Perspective from New Structural Economics[J]. Studies on National Modernization, 2025, (02): 32-40.

[2] Huang Q H. New Quality Productive Forces Are Inherently Green Productive Forces[J]. Studies on Ecological Civilization, 2024, (02): 14-44.

ISSN: 2692-7608 DOI: 10.6981/FEM.202601_7(1).0013

[3] Ling X X, Xie H Y, Tuo L, et al. The Three Dimensions of New Quality Productive Forces: Spatiotemporal, Structural, and Technological Dimensions[J]. Journal of Xinjiang Normal University (Philosophy and Social Sciences), 2024, 55(01): 66-77.

[4] Liu W. Scientific Understanding and Practical Development of New Quality Productive Forces[J]. Economic Research Journal, 2024, 99(03): 4-11.

[5] Ren B P. The Logic of Productivity Modernization Transformation Forming New Quality Productive Forces[J]. Economic Research Journal, 2024, 99(03): - .

[6] Gao F. Systematic Integration: The Basic Methodology for Developing New Quality Productive Forces[J]. Reform, 2024, (77): 21-32.

[7] Zhan Y, Li S N. New Quality Productive Forces Promote the Modernization of Industrial Chains: Logic, Mechanism, and Path[J]. Reform, 2024, (05): 44-63.

[8] Jia R X, Wang J Y, Dou H T. Promoting High-Quality Regional Development with New Quality Productive Forces[J]. Reform, 2024, (03): 77-88.

[9] Zhou W, Yang Z Y. New Quality Productive Forces and National Competitive Advantages: Internal Logic and Strategic Priorities[J]. Teaching and Research, 2024, (06): 72-77.

[10] Xu Z, Zheng L H, Ding S H. The Internal Mechanism and Strategic Choice of New Quality Productive Forces Promoting Common Prosperity[J]. Reform, 2024, (04): 41-99.

[11] Fang T, Zhou W. New Quality Productive Forces Empower High-Quality Supply and Lead the Creation of New Demand[J]. Consumer Economics, 2024, 40(04): 21-29.

[12] Wang J, Wang R J. New Quality Productive Forces: Index Construction and Spatiotemporal Evolution[J]. Journal of Xi'an University of Finance and Economics, 2024, 37(01): 31-77.

[13] Dong Q Q. Measurement, Spatiotemporal Evolution, and Convergence of New Quality Productive Forces Development Level in China[J]. China Soft Science, 2024, 404(08): 188-188.

[14] Zhao Y M. Empirical Measurement and Path Research on the Development of New Quality Productive Forces in Central China[J]. Statistics and Management, 2024, 39(07): 105-112.