ISSN: 2710-0170

# Research on the Theoretical Connotation and Realization Path of New Quality Productivity

Lei Zhao, Zejiong Zhou*

School of Economics, Anhui University of Finance and Economics, Bengbu, Anhui 233030, China

*Corresponding author: aczzj123456@163.com

## Abstract

**The new quality productivity, as the embodiment of the qualitative change of productivity, has become the key driving force to promote the current economic development. Based on the theory of new quality productivity, this paper expounds the "new quality" of new quality productivity from four aspects: element composition, driving factors, industrial carriers and production relations. First of all, it discusses the new elements of new productivity; Secondly, the key role of technological innovation in driving factors is analyzed; Thirdly, the mechanism of the formation of new productive forces by industrial carriers is studied; Finally, the new production relations matching with the new quality productivity are analyzed. Accordingly, this paper puts forward the realization path of accelerating the formation of new quality productivity from four aspects: the guidance of technological innovation, the improvement of factor quality, the optimization of production relations, and the in-depth transformation of industry.**

## Keywords

**New quality productivity; Scientific and technological innovation; New elements; Production relations; Industrial carrier.**

## 1. Introduction

In September 2023, General Secretary Xi Jinping first proposed the concept of "new quality productivity" at the Symposium on promoting the comprehensive revitalization of Northeast China in the new era hosted by him. As the embodiment of the qualitative leap of productivity, the new qualitative productivity is regarded as the key driving force for China's high-quality economic development. It is not only the development of Marxist Productivity Theory, but also a scientific response to the reality of contemporary China's economic and social development. At present, the academic research on new qualitative productivity mainly focuses on the following points: first, the theoretical research on new qualitative productivity, including connotation, characteristics and evolution logic (Huying[1]; huangqunhui and Sheng fangfu[2]; Jiang yongmu and Qiao zhangyuan[3]; Meng Jie and Hanwenlong[4]). The second is about the formation of new productivity (Jiaoyong and Gaoyuepeng[5]; Wuqun and Chen Qian[6]). The third is the measurement of new productivity (Hanwenlonget al.[7]; Zeng Peng et al.[8]). Fourth, the practical significance of new productivity, such as new productivity enabling high-quality development (Liu Yang and Lihaoyuan[9]), new productivity and new industrialization (Yudonghua and Malumeng[10]), new productivity and regional coordinated development (Zhong yexi and Wusiyu[11]). This paper aims to systematically interpret the theoretical connotation of new quality productivity based on General Secretary Xi Jinping's discussion on new quality productivity, and put forward its formation path, so as to further enrich and expand relevant research.

ISSN: 2710-0170

## 2. Proposal of New Quality Productivity

The theory of new quality productivity is based on Marxist Productivity Theory, Innovation theory based on the reality of contemporary social and economic development. Marx pointed out in Das Kapital that productivity is the material force that laborers create use value through specific labor acting on the means of production. Its composition includes three elements: laborers, labor objects and means of labor. With the acceleration of the new round of information technology revolution and industrial reform, the constituent elements of productivity have changed significantly. Digital technology promotes the deep integration of science and technology in various fields, and the industrial boundary is gradually blurred. These changes require new productivity theory to explain. At the same time, under the background of increasing resource and environmental constraints, the traditional mode of production is facing severe challenges, and the importance of green technology and green industry is increasingly prominent. Therefore, the theory of new quality productivity especially emphasizes the realization of sustainable economic growth through scientific and technological innovation and efficient utilization of resources, which not only inherits the basic framework of Marxist Productivity Theory, but also carries out innovative development in the context of the new era.

## 3. Theoretical Connotation of New Productive Forces

### 3.1. New quality productivity highlights "new" and "quality"

The new quality productivity is generated by the revolutionary breakthrough of technology, the innovative allocation of production factors, and the in-depth transformation and upgrading of industry. Driven by scientific and technological innovation, it takes the qualitative change of "high-quality" workers, new labor tools, new labor objects and their optimal combination as the basic connotation, and the improvement of total factor productivity (TFP) as the core symbol. Compared with the traditional productivity, the new quality productivity is not only a change in the composition of productivity elements, but also a qualitative leap. The traditional productivity mainly depends on a large number of resources and energy input, which is factor driven, and its production efficiency is relatively low; Under the background of the new era, the new quality productivity through technological innovation. The recombination of new and factor allocation will realize the qualitative leap of productivity. Its "new" is reflected in the innovation of the composition of system elements, including new labor force, new labor objects and new labor tools, new production relations and new industrial carriers. Its "quality" is reflected in two aspects: first, the quality state, through the renewal of the constituent elements. Realize the iteration of element quality state. Second, the improvement of production efficiency brought by productivity is embodied in the improvement of total factor productivity.

### 3.2. New quality productivity is composed of new elements

The elements of new productivity mainly include new labor force, new labor tools and new labor objects. These elements interact and promote each other, and together constitute a dynamic development of productivity system.

Labor force is the primary factor in the constituent elements of productivity. As the core component of productivity, the labor force carries knowledge, experience, skills and other resources with a high degree of activity, subjective initiative and creativity to drive the development of productivity. Compared with the traditional skilled labor force, new quality productivity requires high-quality new labor force, including strategic talents who can create new quality productivity, R&D talents who can innovate and create new labor tools, applied talents who can skillfully use and master new labor tools, and innovative talents who can expand and create new labor objects. New workers are the most creative subjects. Being able

ISSN: 2710-0170

to innovate and use labor tools, develop and expand labor objects is the key factor of new quality productivity.

Labor tools are an important factor in the composition of productivity, the carrier and direct symbol of productivity, and the objective basis for dividing the historical development stages of human society. The advancement, scientific and technological content and application level of labor tools directly reflect the development level of productivity and social development stage. For example, the steam engine is a labor tool representing the era of industrial revolution, and computers and the Internet are labor tools in the information age. With the continuous advancement of the scientific and technological revolution and industrial reform, new labor tools mainly refer to intelligent tools such as artificial intelligence, digital tools such as the Internet and the Internet of things, virtual tools such as virtual reality and augmented reality devices. These new labor tools are the technical embodiment of productivity in the intelligent era. As the technical embodiment of the new quality of productivity, the new labor tools continuously provide new tools for workers through continuous iteration, which directly expands the depth and breadth of the new labor object, and is an important element in the productivity system.

The object of labor is another important factor in the composition of productivity, and together with labor tools, it constitutes the "material" element of productivity. With the innovative use of digital, intelligent and virtualized new labor tools, new labor objects have emerged, expanding the scope of labor objects, and expanding the spatial and technological boundaries of production activities. The birth of new labor objects, for example, the development of digital technology makes non-material data become new labor objects. The object of labor not only covers the fields of new materials, new energy and other physical forms, but also extends to digital resources and intellectual resources, such as data, intellectual property, patents and technical standards, which have become an important part of productivity. The new labor objects not only expand the scope of production factors, but also expand the wide space of production activities. For example, the formation of a global production network and the development of Internet and logistics technology enable enterprises to optimize resource allocation globally, so as to achieve more efficient production and operation. In addition, the application of virtual reality and augmented reality technology also makes virtual production possible. New production modes such as virtual laboratory and virtual factory are gradually applied to R&D, design and production. Technological progress continues to push the boundaries of productivity forward, and new labor.

The emergence of moving objects is an important driving force in this process. For example, the application of automation and artificial intelligence technology makes intelligent robots and automation systems improve the efficiency and accuracy of the production process in the manufacturing industry. At the same time, the application of artificial intelligence in data analysis and decision support has significantly improved the intelligent level of production management. In terms of green technology and sustainable development, the concept of environmental protection and sustainable development gave birth to green technology and environmental protection industry. The development and utilization of new labor objects such as new energy and new materials provide new impetus for the sustainable development of economy. In addition, the integration of information technology, biotechnology and new materials technology has spawned new fields such as nanotechnology and quantum computing, which not only expands the technological boundary of productivity, but also opens up new space for future economic development. As the object of action and application scenarios for new workers to operate new labor tools, new labor objects require new workers with higher quality, which can promote the development of new labor tools.

In short, the new quality productivity is a system composed of new workers' innovation and operation of new labor tools acting on new labor objects. With the rapid development of digital,

ISSN: 2710-0170

intelligent, virtualization and other new technologies, new workers with digital skills and interdisciplinary ability operate and use new labor tools such as intelligent systems and virtualization technology to act on new labor objects such as digital resources. From this process, it can be seen that each constituent element of the new quality productivity is undergoing a qualitative change. Workers have upgraded from traditional skills to high-quality talents with multidimensional knowledge structure, innovation ability and lifelong learning. Labor tools have changed from traditional machinery to new production tools such as intelligent chemical tools, digital platforms and virtualization tools. The scope of labor objects has changed from traditional physical labor objects such as raw materials and parts to new labor objects such as data. Knowledge resources have become important labor objects, and production space and technology boundaries have been expanded. Qualitative changes have taken place in the combination of factors: first, collaborative innovation between various factors has become the key, and workers use intelligent tools and digital platforms to carry out innovation activities to promote the continuous optimization of the production process; The second is the dynamic allocation and flexible scheduling of factors to maximize the efficiency of resource utilization. With the support of cloud computing and Internet of things technology, resources can be allocated on demand to achieve the optimal combination of production processes. Compared with the traditional productivity, the new quality productivity has the characteristics of new quality in addition to the qualitative change of its constituent elements, its driving factors, the production relationship between the industrial carrier and the new quality productivity.

### 3.3. New quality productivity is driven by technological innovation

With technological innovation as the main driving force, the new quality productivity enables the entity elements through technological innovation, optimizes the allocation of resources, and promotes the qualitative leap of productivity. This innovation is not only reflected in the improvement of the utilization efficiency of traditional factors such as workers and capital, but also in the enhancement of the interaction and synergy among various factors. First, technological innovation enables traditional elements such as labor and capital to improve their utilization efficiency. For example, the application of artificial intelligence technology enables a large number of repetitive and mechanical work to be completed by machines, which improves the production speed and accuracy, reduces the labor input, and significantly improves the labor productivity. Second, technological innovation enhances the interaction and synergy of various elements. Technological innovation, such as digital technology, enables capital, labor and resources to be more closely combined and interacted to achieve synergy, and promotes the deeper integration of entity elements and non entity elements of data, thus promoting the qualitative change of productivity. Third, digital technology makes resource allocation more efficient. For example, big data and artificial intelligence technology realize more accurate market prediction and decision support, making resource allocation more scientific and efficient. Fourth, technological innovation, especially the development of green technology, has led to the green transformation of production mode. Through the application of green technologies such as clean energy technology and low-carbon technology, the mode of resource utilization has been improved and the resource investment has been reduced, thus giving the concept of green development to new productivity and achieving sustainable economic growth.

### 3.4. New quality productivity is guaranteed by new production relations

General Secretary Xi Jinping emphasized that "production relations must be adapted to the requirements of the development of productive forces. To develop new quality productive forces, we must further comprehensively deepen reforms and form new production relations that are adapted to them." New quality productive forces are driven by technological innovation and consist of new quality factors such as new labor force and data. Therefore, new production

ISSN: 2710-0170

relations must meet the needs of technological innovation, promote innovative allocation and optimized combination of factors. The forms of production relations include technological systems, economic systems, legal mechanisms, etc. The specific role of new production relations in ensuring new quality productivity is reflected in the following aspects: firstly, promoting technological innovation. The technological system, as a part of production relations, can be improved and optimized to stimulate the vitality of technological innovation. For example, by establishing a risk sharing mechanism for technological innovation, the enormous risks faced by cutting-edge technological innovations such as quantum technology can be effectively reduced, thereby encouraging more technological breakthroughs. The second is to optimize resource allocation and element combination, for example, clear ownership of data property rights can promote the optimal allocation of data elements and promote the deep integration of data with other elements. The third is to stimulate the creativity of factor participants. With the addition of new elements such as knowledge, data, and information, traditional working hours are no longer the standard for measuring contributors, and their value may be reflected in technical solutions or data analysis capabilities. Therefore, the new distribution system comprehensively considers the actual contributions of multiple factors to distribute benefits, ensuring the protection of factor rights and effective incentives.

### 3.5. New quality productivity is based on emerging industries as industrial carriers

Industries are the mapping of technology and factors, and are the carriers of productivity. The formation of new quality productivity requires the support and promotion of emerging industries. Emerging industries are based on disruptive technologies and breakthroughs in cutting-edge key technologies, characterized by high-end factor intensity, representing the direction of future economic development. Typical emerging industries include strategic emerging industries such as new generation information technology and artificial intelligence that have already begun to take shape, as well as future industries such as metaverse, brain computer interfaces, quantum information technology, and humanoid robots that are in their infancy. The mechanism of emerging industries to promote the formation and development of new quality productivity is mainly reflected in the following points: first, emerging industries are the forefront of technological innovation. By constantly breaking through disruptive technologies and cutting-edge key technologies, they have empowered production factors and significantly improved the quality of factors. At the same time, the synergy, agglomeration and portfolio optimization of high-end factors in emerging industries have also promoted the qualitative change of productivity. The second is the cross-border integration and Industrial Synergy of emerging industries. Emerging industries have the characteristics of cross-border integration. Through the combination with other industries, they have spawned new business models and industrial forms, which not only expand the space for industrial development, but also provide more possibilities for the formation of new productivity. For example, the combination of artificial intelligence technology and manufacturing industry promotes the development of intelligent manufacturing. Third, emerging industries help the green transformation of new quality productivity. The development of emerging industries such as low-carbon technology and clean energy technology has helped the green transformation of productivity.

### 3.6. The core symbol of new productivity is the substantial increase in total factor productivity

Total factor productivity refers to the remaining part of the economic aggregate growth after deducting the contribution of the increase in input factors to economic growth. The new productivity is mainly marked by the significant improvement of TFP: first, technological progress is the key factor to promote the improvement of TFP. New technologies such as big

ISSN: 2710-0170

data, Internet and artificial intelligence form new development momentum through technological innovation and industrial structure optimization. These technologies not only reshape the mode of production, but also significantly improve the production efficiency. Technological progress has improved the production process and reduced redundant inputs, thus improving the production efficiency of unit factors and further promoting the growth of TFP. Secondly, the improvement of TFP is realized through the optimized combination of element configuration. The application of digital technology reduces the transaction cost of elements, makes the resource allocation more flexible and efficient, and data makes the element configuration more accurate and efficient, which promotes the optimization of element combination and the growth of TFP.

## 4. Realization Path of New Quality Productivity

At present, the development of new quality productivity has become a key measure for China to seize new opportunities, seize the commanding heights of development and seize the opportunities for future development. Facing the realistic challenges such as the shortage of resources and the lack of independent innovation ability, China urgently needs to promote high-quality development through the development of new quality productivity. This paper puts forward the realization path of new quality productivity from four aspects of technological innovation.

### 4.1. Core technology guidance

General Secretary Xi Jinping pointed out that "we must strengthen scientific and technological innovation, especially original and subversive scientific and technological innovation, accelerate the realization of high-level scientific and technological self-reliance, and fight for key core technologies, so that original and subversive scientific and technological innovation achievements can emerge, and cultivate new momentum for the development of new quality productivity". The development of new quality productivity is led by core technology. First, accelerate the development and integrated application of digital technology, empower workers and labor tools with digital technology, improve production efficiency and industrial basic capacity. Improve production efficiency and management level through the application of digital technology; Digital technology empowers the real economy, promotes the deep integration of digital and real economies, and improves the basic industrial capacity and competitiveness. The second is to strengthen original and disruptive technological innovation, which has the characteristics of profound technological foundation, triggering disruptive changes in technology, business model and so on. We should increase the R&D support of cutting-edge technology, and provide a steady stream of new momentum for the development of new productivity. The third is to promote the innovation of key core technologies, especially in the research and development of core technologies in the fields of new generation information technology, biotechnology and new energy, so as to ensure that China occupies the technological commanding height in the global competition.

### 4.2. Improvement of Element Quality

In terms of new labor force, strengthening the cultivation of new labor force requires deepening education reform, building an education system that is compatible with new quality productivity, especially in terms of professional settings in higher education and vocational education that match market demand and industry demand, increasing the integration of industry and education, encouraging lifelong learning, improving continuing education and vocational training systems, and enhancing the skill level of existing workers. In terms of new labor tools: firstly, increase research and development investment in the field of intelligent equipment, especially in the areas of artificial intelligence, virtual reality, augmented reality

ISSN: 2710-0170

equipment, and automated manufacturing equipment, to promote technological innovation; The second is to strengthen the construction of new infrastructure, increase investment in information infrastructure represented by 5G and high-speed networks, and ensure technological leadership. In addition, it is necessary to increase investment in integrated infrastructure and innovative technology facilities, promote the organic integration and coordinated development of various technologies, and thusimprove the overall level of infrastructure. In terms of new labor objects: firstly, promote the marketization of data elements, stimulate the vitality of data elements through clarifying data property rights and improving transaction mechanisms, and fully tap into the value of data. The second is to promote the integration of data elements with other elements, unleashing the enormous potential of data for improving productivity. Specific measures include supporting enterprises to widely apply data technology in the production process, promoting the integration of data and financial capital, etc.

### 4.3. Optimization of Production Relations

Firstly, deepen the reform of the scientific and technological system. One is to improve the market-oriented mechanism for technological innovation, fully leverage the guiding role of the market in the allocation of innovative factors, and promote effective resource allocation; Secondly, we will improve the mechanism for the transformation of scientific and technological achievements, promote the establishment of various institutions and technology trading markets for the transfer and transformation of scientific and technological achievements, and improve and perfect the scientific and technological service system; The third is to improve the risk sharing mechanism and reduce the risks of technological innovation. Secondly, deepen the reform of the economic system. One is to establish a unified factor market, guided by market mechanisms, to promote the free flow and optimized allocation of production factors; The second is to improve the market-oriented mechanism for obtaining rewards through production factors such as data and technology, safeguard the interests of factor participants, and stimulate innovation.

### 4.4. Deep transformation of industries

First, we should attach great importance to the innovation and application of new generation information technologies such as the Internet and intelligent terminals, focus on strengthening the digital economy, promote the integration of the digital economy and the real economy, and promote the upgrading of traditional industries through the transformation of digital technology and the empowerment of traditional industries. The second is to accelerate the research and application of cutting-edge technologies such as quantum technology and future networks, actively layout future industries, and seize the strategic high ground of future development. The third is to vigorously develop green energy technology and low-carbon technology, encourage enterprises to implement green transformation, promote the growth of green industries, focus on tackling the core technical problems of green and low-carbon, promote the green transformation of the entire industry, and thus achieve sustainable economic development.

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ISSN: 2710-0170

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