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The Impact of New Quality Productivity on the Division of Labor in Global Value Chains

--Empirical Evidence from Cross-Country Samples

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Abstract

How new quality productivity affects the position of division of labor in global value chains is a research topic with important theoretical significance and practical value. Based on transnational panel data, this paper makes an empirical study on the impact of new quality productivity on the division of labor in global value chains. Firstly, according to the theoretical connotation of new quality productivity and global value chain, the evaluation index system of new quality productivity is constructed from three perspectives: science and technology productivity, green productivity and digital productivity. From the perspective of technological heterogeneity, the paper constructs the global value chain division position index comprehensively and systematically, and calculates and analyzes the global value chain (GVC) division position of each country. Secondly, we use a variety of measurement methods to empirically test the impact of new quality productivity on the global value chain and its mechanism. Finally, according to the conclusion of the study, the paper puts forward some policy suggestions to promote the promotion of the global value chain division from the perspective of new quality productivity.

Keywords

New quality productivity; Global value chain division position; Cross-country sample.

1. Introduction

With the deepening of economic globalization and the deepening of international division of labor, Chinese enterprises actively participate in the international division of labor by virtue of labor cost advantages, and become an important part of the global value chain. The report of the 19th National Congress of the Communist Party of China proposed to "promote China's industry towards the middle and high end of the global value chain", and the report of the 20th National Congress of the Communist Party of China once again emphasized that "the implementation of industrial base reconstruction projects and major technical equipment research projects, and support the development of specialized and special new enterprises", which provides direction for Chinese enterprises to climb higher links in the global value chain. Innovation plays a leading role, gets rid of the traditional economic growth mode and productivity development path, has the characteristics of high technology, high efficiency, high quality, and conforms to the new development concept of advanced productivity quality is an important basis for the promotion of global value chain division of labor status. In the global value chain division of labor, the comparative advantage and competitive advantage between countries or regions will change constantly with the development of new quality productivity. The development of new quality productivity can improve production efficiency, reduce

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production costs, improve product quality and added value, and thus enhance the competitive advantage of participating in the division of labor in the global value chain.

In recent years, the academic circle has discussed the division of labor and new quality productivity of global value chain, but there are still some shortcomings: on the one hand, the research perspective is relatively simple, lack of analysis of global factors; On the other hand, the insufficient discussion of the influence mechanism and the lack of systematic theoretical thinking lead to the insufficient practical guiding effect of the research. With the deepening of globalization, the global value chain (GVC) is spread around the world, and the production network covering the world is increasingly prosperous. At the same time, the global value chain, as an organization and governance mechanism, allocates production factors globally through the international division of labor network and generates trade flows, so the new quality productivity can have an impact on it. In recent years, under the background of scientific and technological revolution, the concept of new quality productive forces has been proposed and become the basic idea to guide the high-quality development of productive forces in our country. Therefore, whether from the theoretical level or the practical level, it is necessary to accelerate the formation of new quality productivity as a starting point, to explore the impact on the global value chain division of labor status. New quality productivity is a new form of productivity based on key disruptive technological breakthroughs, with scientific and technological innovation as the core, and is the core driving force for cultivating endogenous driving forces and enhancing new growth drivers in the future. Therefore, based on transnational panel data, this paper will systematically discuss the impact of accelerating the formation of new quality productivity on the division of labor in global value chains. Specifically, at the theoretical level, based on the full review and reference of existing relevant theories and a deep understanding of the new quality productivity and the division of labor status of global value chain, the evaluation index system of new quality productivity is constructed from three perspectives of scientific and technological productivity, green productivity and digital productivity, and the entropy method is used to measure the level of new quality productivity. On the other hand, the GVC division position index is used to measure the global value chain division position of different countries, and the quantitative model of new quality productivity and global value chain division position is constructed. At the practical level, the sorting out of the actual blocking points and the exploration of the realization path can provide certain policy enlightenment for the policy formulation and system optimization in related fields.

2. Literature Review

since the new quality productivity was proposed in September 2023, relevant research has become the focus of academic attention, and many scholars have conducted extensive research and discussion on the position of global value chain division, forming a relatively rich research results.

2.1. Research on new quality productivity

Around the new quality productivity, the academic circles focus on its connotation and value two aspects of a wide range of discussions. New quality productivity is an economic category with rich connotation and profound meaning, which represents a kind of productivity transition, and is a productivity in which scientific and technological innovation plays a leading role. To accurately understand the connotation and characteristics of new quality productivity, we need to grasp from the two aspects of "new" and "quality". (Zhou Wen et al., 2024). Wei Chonghui (2023) grasped its basic meaning from the perspectives of discourse context, Marxist classical discourse, and the diversity of production factors in the new era. At present, scholars have a certain research basis for the realization of the new quality productivity, focusing on theoretical interpretation and policy analysis. Scholars reached a consensus on scientific and

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technological innovation leading to accelerate the development of new quality productivity, and new quality productivity promoting high-quality development (Yin Ximing et al., 2024; Xu Zheng et al., 2023), but the specific realization path considered is different. Sheng Chaoxun (2024) pointed out that we should seize the opportunities of the new round of scientific and technological revolution and industrial transformation, fully stimulate the vitality of enterprises and entrepreneurial talent, and gather the great power formed by new quality productivity.

2.2. Research on the position of division of labor in global value chains

Measuring the position of division of labor in global value chain has always been an important topic in academic research, and scholars have not reached a consensus on the evaluation index measurement method. At present, both the upstream degree of the industry and the division of labor position index of the value chain used by the academic community measure the upstream and downstream positions in the global value chain, that is, the embedded positions. However, the division position of the global value chain is not only related to the "physical attributes" of the specific production links and positions in the production process. It is also related to the "economic attributes" of value-added creation ability in different links and stages (Song Jie et al.; By 2022). For example, Zhang Chenxia and Li Ronglin (2023) used the GVC division status index proposed by koopman et al to measure a country's global value chain division status. Huang Liangxiong et al. (2024) constructed a global value chain bargaining power index from the perspective of export product prices to represent the division of labor in the global value chain of various sectors of the economy. In addition, some scholars believe that the distribution and logistics services of manufacturing can significantly promote the improvement of the division of labor status of global value chains (Wang Hongmei et al., 2023), and the network centrality and structural hole of free trade agreements have a positive effect on the improvement of the division of labor status of global value chains (Zhang Chenlin et al., 2023).

3. The Impact of New Quality Productivity on the Division of Labor in Global Value Chains

3.1. Scientific and technological productivity

Scientific and technological productivity plays an important role in the division of labor in the global value chain. With the continuous progress and innovation of science and technology, the global industrial structure has undergone great changes, and the status of science and technology productivity in the global economy has become increasingly prominent.

Technological productivity has had a profound impact on the way global value chains are divided. The traditional global value chain is based on labor cost, but with the development of science and technology, many industrial production processes have begun to be automated and intelligent, and a large number of low-tech labor positions have been replaced by machines and robots, which has reduced the demand for labor in the global value chain. On the contrary, high value-added technology research and development, design and management have become the core links in the global value chain. The improvement of scientific and technological productivity has enabled developed countries to have stronger scientific and technological research and innovation capabilities, and to play a more important role in the global value chain. The improvement of scientific and technological productivity has promoted the transfer of global value chains to high-end links. With the progress of science and technology, countries can improve their production efficiency and quality level by introducing advanced technology and equipment. This gives some developing countries the opportunity to play a more important role in global value chains. For example, by vigorously developing scientific and technological innovation and personnel training, China has gradually moved from the low-end to the high-

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end link of the global value chain, and realized the upgrading of the economic structure and the optimization of the industrial chain. The improvement of scientific and technological productivity has an impact on the balance of the division of labor in the global value chain. On the one hand, the continuous improvement of scientific and technological productivity makes the position of developed countries in the global value chain more stable. They form certain technical barriers by controlling advanced technology and intellectual property rights, thus enjoying more benefits in the global value chain. On the other hand, the improvement of scientific and technological productivity also provides opportunities for some developing countries, which can gradually integrate into the global value chain through technology introduction, innovation, transformation and upgrading, and gain more benefits in it.

All in all, the impact of science and technology productivity on the division of labor in the global value chain cannot be ignored. The progress of science and technology has transformed the value chain from the traditional labor-intensive to the technology and knowledge oriented, and promoted the upgrading and reform of the global industrial structure. However, the impact of science and technology productivity on different countries and regions is not consistent, and different countries need to actively respond according to their own actual conditions, strengthen science and technology innovation and personnel training, in order to adapt to the changes in the division of labor in the global value chain.

3.2. Green productivity

Green productivity plays an important role in the division of global value chains. With the increasingly prominent environmental problems, the promotion of green productivity has become an important goal of the sustainable development of the global economy.

The improvement of green productivity has promoted the transformation of global value chains towards environmental protection and sustainable development. There are many problems in the traditional global value chain, such as high resource consumption, low energy utilization and serious environmental pollution. With the rise of green technology and environmental awareness, more and more enterprises have begun to pay attention to the requirements of environmental protection and sustainable development, and realize the protection and sustainable use of the environment by improving the production process and introducing green technology. This has promoted the status of some countries and regions in the global value chain, thus gaining more advantages in market competition. The increase in green productivity has an impact on environmental standards and trade barriers in global value chains. With the popularization of environmental awareness and the improvement of environmental protection requirements, the requirements of environmental protection in various countries are becoming increasingly strict. In the global value chain, some countries restrict the import of environmentally harmful products and production methods and promote the export of green products by strengthening the development of environmental regulations and standards. This has led to some adjustments and reconfigurations in the division of labor in the global value chain, some enterprises that do not meet the environmental protection requirements may need to undergo technological transformation or exit the market, while those that meet the environmental protection standards are able to gain more business opportunities and competitive advantages. The improvement of green productivity has an impact on consumer demand in the division of global value chains. With the increase of people's environmental awareness, the demand for green and sustainable products is growing. This has led some enterprises to incorporate green production into strategic planning, meet consumer demand for environmentally friendly products through green innovation, and gain market share and brand reputation. In the global value chain, these enterprises implement environmental protection measures in the production process to improve the competitiveness and added value of their products.

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The impact of green productivity on the division of labor in global value chains cannot be ignored. The improvement of green productivity has promoted the transformation of global value chains towards environmental protection and sustainable development, and prompted some countries and regions to achieve a better competitive position in the global market. At the same time, the improvement of green productivity also has an impact on environmental standards and consumer demand, leading the adjustment and transformation of the global value chain division of labor. In order to achieve sustainable economic development, countries should strengthen cooperation, take active environmental protection measures, and promote the continuous improvement of green productivity.

3.3. Digital productivity

The impact of digital productivity on the division of labor in global value chains is very significant. The continuous development and application of digital technologies has enabled various countries and regions to play different roles in the global value chain.

The increase in digital productivity makes the acquisition and transmission of information and data more convenient and efficient. This greatly reduces the cost of communication between multinational enterprises and promotes the smooth flow of global supply chains. Through digital technology, enterprises can better manage and coordinate production and supply on a global scale, achieving closer cooperation and coordination. This enables countries to play a more important role in global value chains and enhance their competitiveness by providing high value-added links and services. The development of digital productivity has also accelerated the restructuring and restructuring of global value chains. The division of the traditional industrial chain is often dominated by the production link, and the popularization and application of digital technology has changed this pattern. The emergence of digital technology has enabled many links that used to be completed in one place to be fully distributed across the globe through technologies such as the Internet and cloud computing. This means that different countries and regions can participate in the global value chain through their own advantages and characteristics. Some emerging economies have made outstanding achievements in digital industries and services, moving up the global value chain. The increase in digital productivity has also brought about the deepening and refinement of the division of labor in the global value chain. The application of digital technology has made products and services much more customized. The needs of consumers are increasingly diversified, and the requirements for personalization and customization are increasingly high. This requires companies to be more flexible and agile in the global supply chain, able to personalize production and services according to the needs of different regions and markets. This requires countries to play different roles in the global value chain, no longer simply division of labor, but to provide differentiated competitive links and services according to their own advantages and characteristics.

The impact of digital productivity on the position of division of labor in global value chains is multifaceted. It promotes the smooth flow and collaboration of the global supply chain, accelerates the reconstruction and reorganization of the global value chain, and also promotes the deepening and refinement of the division of labor in the global value chain. In the digital era, countries and regions should make full use of the advantages of digital technologies to enhance their position and competitiveness in the global value chain.

4. Policy Suggestions

4.1. Promoting digital transformation

The government should formulate and promote digital transformation strategies and policies to encourage enterprises to increase the application and innovation of digital technologies.

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Provide the necessary training and support to help businesses master digital technologies, improve productivity and competitiveness. At the same time, the government should also increase investment in digital infrastructure, promote the construction of networks across the country, and provide a stable and reliable communication and data transmission environment.

4.2. Establishing an innovation support system

The government should encourage and support the development of innovative enterprises by providing them with policy support such as tax incentives, research project funding and intellectual property protection. We will create a favorable environment for innovation, strengthen industry-university-research cooperation, and promote the research, development and application of new technologies and products. Through innovation, we can increase the added value of enterprises and enable them to play a more important role in global value chains.

4.3. Strengthening personnel training and education

Nurturing people with digital skills and a sense of innovation is key. The government should increase investment in education and training, provide a comprehensive education system, and cultivate the innovative spirit and practical ability of young talents. A vocational education system should be established to meet the needs of industries, and skilled workers and professionals should be trained to meet the needs of new quality productivity.

4.4. Expand international cooperation and exchanges

The government should actively promote international cooperation and exchanges and strengthen cooperation with other countries. By promoting trade liberalization and facilitation, China will open wider to the outside world and attract foreign investment and technology introduction. Strengthen scientific and technological cooperation with developed countries and emerging economies, jointly research, develop and apply advanced technologies, and improve their position in the global value chain.

4.5. Strengthening intellectual property protection

The government should strengthen the protection of intellectual property rights and strengthen laws and enforcement. Establish a sound intellectual property protection system, encourage enterprises to innovate and apply for intellectual property rights, and protect their innovation achievements. This helps to improve the innovation drive and competitiveness of enterprises, so that they occupy a better position in the global value chain.

4.6. Improving the business environment

The government should intensify reform efforts to optimize the business environment. Simplify administrative approval procedures and reduce business start-up and operation costs. We will strengthen regulation of fair competition and prevent monopolistic practices and unfair competition. Provide a stable and reliable investment environment to attract domestic and foreign investors.

In short, the impact of new quality productivity on the division of labor in global value chains requires governments to take active policy measures to adapt and guide. Policies and measures to promote digital transformation, strengthen innovation support, cultivate talents, expand international cooperation, strengthen intellectual property protection and optimize the business environment can enhance the position of countries in the global value chain and enhance their comprehensive competitiveness. This will contribute to sustainable economic development and shared prosperity.

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