

Research on the Impact of Digital Trade Development on The Resilience of Manufacturing Global Value Chain

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Abstract: As the core element of modern digital economy, digital trade plays an important role in the toughness of the global value chain of manufacturing industry and the high-quality development of manufacturing industry. This paper makes an empirical study on the impact of digital trade on the resilience of manufacturing global value chain. Firstly, according to the theoretical connotation of Digital Trade and global value chain resilience, the development level of digital trade is measured from four dimensions: digital innovation, digital trade capacity, infrastructure environment and trade potential; From the two aspects of security and stability, this paper constructs the manufacturing global value chain toughness index, calculates and analyzes the manufacturing global value chain toughness of various countries. Secondly, we use a variety of econometric methods to empirically test the impact of digital trade on the length of the global value chain and its mechanism, to investigate how digital trade affects the division of labor in the global value chain, and further explore the impact on the toughness of the global value chain. Finally, according to the research conclusion, from the perspective of digital trade, this paper puts forward policy suggestions to promote the resilience of the manufacturing global value chain.

Keywords: Digital trade; Manufacturing; Global value chain resilience.

1. Introduction

In the context of global economic integration, as an important pillar of the national economy, the status and resilience of the manufacturing industry in the global value chain have far-reaching significance for the stability and development of the national economy. In recent years, with the rapid development of information technology, digital trade, as the core element of modern digital economy, has gradually become the key force to promote the transformation of the global economic pattern. It has not only changed the traditional trade mode and industrial organization mode, but also had a profound impact on the toughness of the global value chain of manufacturing industry. The resilience of manufacturing global value chain refers to the ability of manufacturing industry to maintain stable operation, rapid recovery and achieve sustainable development in the global value chain under the external shocks such as global economic fluctuations, trade frictions and emergencies. Digital trade provides new support and opportunities for the resilience of the global value chain of manufacturing industry through the multi-dimensional role of digital innovation, trade capacity improvement, infrastructure optimization and so on. However, the complexity and uncertainty of the current global trade environment are increasing. The rise of trade protectionism, geopolitical conflicts and other factors pose a serious threat to the stability of the global value chain of manufacturing industry. In this context, in-depth study of the impact mechanism of digital trade on the resilience of manufacturing global value chain has important practical significance for improving the status of China's manufacturing industry in the global value chain, enhancing its anti risk ability and promoting the high-quality development of manufacturing industry.

This paper aims to systematically explore the impact of digital trade on the resilience of manufacturing global value chain and its path of action. Firstly, based on the theoretical

connotation of Digital Trade and global value chain resilience, this paper constructs a measurement index system of the development level of digital trade from four key dimensions: digital innovation, digital trade capacity, infrastructure environment and trade potential, and comprehensively evaluates the development status of digital trade in various countries. At the same time, this paper constructs the manufacturing global value chain toughness index from the two core dimensions of security and stability, calculates and analyzes the manufacturing global value chain toughness of various countries, and reveals its differences and characteristics in the global scope. Secondly, this study uses a variety of econometric methods to empirically test the impact of digital trade on the length of global value chain and its mechanism. Through in-depth analysis of how digital trade affects the division of global value chain, this paper further explores its potential impact path on the resilience of global value chain, and reveals the internal relationship between digital trade and the resilience of manufacturing global value chain.

Finally, based on the above research conclusions, this topic puts forward targeted policy recommendations from the perspective of digital trade, aiming to provide theoretical support and practical guidance for improving the resilience of China's manufacturing global value chain and promoting the high-quality development of manufacturing industry. Through this study, we hope to be able to grasp the opportunities and meet the challenges for China in the global digital economy competition, and provide useful supplement and reference for academic research in related fields.

2. Characteristic Facts of the Impact of Digital Trade Development on the Resilience of Manufacturing Global Value chain

2.1. Research Status

At present, the research on the impact of digital trade on the resilience of the manufacturing global value chain has gradually attracted attention, but overall, it is still in the preliminary exploration stage. Although previous studies have discussed the impact of digital trade on the upgrading and participation of global value chain (GVC), there are relatively few studies on the resilience of manufacturing GVC. Most studies focus on the impact of digital trade on the embedded position and division of labor in the global value chain, and the mechanism of digital technology on the toughness of the industrial chain. However, there is a lack of systematic analysis of the impact of digital trade on the resilience of the manufacturing global value chain from the perspective of the manufacturing industry. In addition, most of the existing studies focus on the promotion of the status of the global value chain of manufacturing industry by digital economy or digital service elements, but how digital trade can enhance the resilience of the global value chain of manufacturing industry through specific paths, especially the mechanism in dealing with the uncertainty of the global trade environment, still needs to be further discussed.

2.2. Research Implications

Under the background of profound changes in the global economic pattern, digital trade, as a new engine to promote economic development, has important theoretical and practical significance on the impact of manufacturing global value chain toughness. From a theoretical perspective, this topic will help fill the gap in the research on the relationship between digital trade and manufacturing global value chain resilience, and further improve the theoretical system of global value chain resilience. From a practical perspective, studying the impact of digital trade on the resilience of the manufacturing global value chain can provide a theoretical basis for relevant policy-making, help the government formulate targeted digital trade policies, and improve the resilience of the manufacturing industry in the global value chain. In addition, the research can also provide guidance for enterprises to deal with the challenges of digital trade, enhance the ability to resist risks, and promote the high-quality development of manufacturing industry. Under the background of rising global trade protectionism and geopolitical tension, enhancing the resilience of the global value chain of manufacturing industry is of great significance to ensure national economic security, promote trade liberalization and economic globalization.

2.3. Typical Facts

In recent years, manufacturing enterprises have significantly enhanced their resilience in the global value chain through digital transformation. For example, by introducing digital technologies such as the Internet of things and big data, General Electric (GE) and Schneider Electric have achieved intelligent management and optimization of the supply chain, significantly improving their stability and security in the global value chain. Foxconn introduced intelligent manufacturing technology to optimize the

production process, reduce production costs, and improve the anti-risk ability of the supply chain. The successful practice of these enterprises shows that digital trade not only changes the production mode of manufacturing industry, but also enhances the toughness of the global value chain of manufacturing industry by optimizing the allocation of resources and improving the efficiency of information sharing. To sum up, the impact of digital trade on the resilience of the manufacturing global value chain is a complex and multidimensional issue. Through combing the existing research and analyzing the typical facts, this topic will systematically explore the specific impact mechanism of digital trade on the resilience of the global value chain of manufacturing industry, and put forward corresponding policy suggestions, in order to provide a useful reference for the research and practice in related fields.

3. Theoretical Framework of the Impact of Digital Trade Development on the Resilience of Manufacturing Global Value Chain

3.1. The Connotation of Digital Trade and Global Value Chain Resilience

Digital trade is not only the electronic transaction of traditional goods and services, but also a technology driven innovation mode. It includes cross-border transactions through digital platforms, the provision of digital services, and the in-depth transformation of traditional trade patterns by digital technology. The core elements of Digital Trade include digital innovation, digital infrastructure, data flow and changes in trade rules. These factors work together to promote the upgrading of trade mode and the reform of industrial organization.

Global value chain resilience refers to the ability of manufacturing industry to maintain stable operation, rapid recovery and achieve sustainable development in the global value chain under the external shocks such as global economic fluctuations, trade frictions and natural disasters. It can be measured from the two dimensions of security and stability, including the anti-risk ability of the supply chain, the flexibility of the production process, and the adaptability of enterprises in the global value chain.

3.2. The Impact Mechanism of Digital Trade on The Resilience of Manufacturing Global Value Chain

In order to fully reveal how digital trade affects the resilience of the manufacturing global value chain, this study constructs a theoretical framework from four dimensions: digital innovation, digital trade capacity, infrastructure environment and trade potential.

Digital innovation is one of the cores and driving forces of digital trade. By introducing big data, artificial intelligence, Internet of things and other technologies, manufacturing enterprises can realize the intellectualization of production process, the visualization of supply chain and the personalization of products and services. These innovations not only improve production efficiency, but also enhance the adaptability and anti-risk ability of enterprises in the global value chain. For example, enterprises can optimize supply chain management through real-time data analysis to reduce the impact of external shocks.

Digital trade capability includes the technology application capability of enterprises or countries in digital trade, the operation capability of digital platforms and the ability to provide digital services. Strong digital trading capabilities can help enterprises better participate in the division of labor in the global value chain and enhance their position in the global value chain. At the same time, the improvement of digital trade capability also helps enterprises to establish a broader cooperation network in the global value chain and enhance their resilience.

Digital infrastructure is the basis for the development of digital trade, including broadband networks, data centers, cloud computing platforms, etc. A good infrastructure environment can reduce the transaction cost of Digital Trade and improve the efficiency of data transmission, to enhance the resilience of the manufacturing industry in the global value chain. In addition, the improvement of infrastructure can also promote the wide application of digital technology and the digital transformation of manufacturing industry.

Trade potential reflects the potential impact of digital trade on the resilience of the manufacturing global value chain. Digital trade provides more market opportunities for manufacturing enterprises by reducing trade barriers, expanding market space and promoting technology diffusion. At the same time, the release of trade potential can also enhance the competitiveness of enterprises in the global value chain and enhance their resilience.

4. Conclusion and Suggestions

4.1. Conclusion

As an important force to promote the resilience of the global value chain of manufacturing industry, the development of digital trade needs not only the support of technological innovation and infrastructure, but also policy guidance and promotion of international cooperation. The implementation of the above specific analysis and policy recommendations can effectively enhance the competitiveness of China's digital trade, enhance the resilience of the manufacturing industry in the global value chain, and contribute to the high-quality development of China's economy and the process of economic globalization.

4.2. Suggestions

4.2.1. Strengthen the construction of digital infrastructure

Digital infrastructure is the cornerstone of the development of Digital Trade and the key support to enhance the resilience of the global value chain of manufacturing industry. The government should continue to increase investment in digital infrastructure, and focus on promoting the construction of 5g network, gigabit optical network, data center and other key facilities. The high-speed and low latency characteristics of 5g network can provide real-time data transmission support for intelligent production in the manufacturing industry, while gigabit optical network can ensure the efficiency of large-scale data interaction between enterprises, and the construction of data center provides a physical basis for the storage and processing of massive data. The improvement of these infrastructures will provide solid technical support for the development of digital trade, reduce the operating costs of Digital Trade and improve transaction efficiency. Moreover, promoting the deep integration of digital technology and manufacturing is the core path to enhance the toughness of

the manufacturing global value chain. The government should encourage manufacturing enterprises to widely apply cutting-edge technologies such as big data, artificial intelligence and the Internet of things through policy guidance and financial support. Through the wide application of these technologies, manufacturing enterprises can not only improve their production efficiency, but also maintain the stability and toughness of the supply chain in the complex global trade environment, to occupy a more favorable position in the global value chain.

4.2.2. Enhance the ability of digital trade

Improving the ability of digital trade is an important way to enhance the toughness of the global value chain of manufacturing industry, which needs to start from two aspects: cultivating the main body of Digital Trade and strengthening talent training. First, the government should actively cultivate the main body of Digital Trade and support digital platform enterprises to improve their internationalization level. The government needs to encourage digital platform enterprises to expand overseas markets through technological innovation and mode innovation through policy guidance and financial support. At the same time, we will accelerate the cultivation of a few leading digital trade enterprises with strong innovation ability and international competitiveness, support small and medium-sized enterprises to take the development path of "specialization and innovation", and build a good ecosystem for the coordinated development of large and medium-sized enterprises. Secondly, strengthening the training of digital trade talents is the key to enhance the ability of digital trade. We should cultivate interdisciplinary talents who understand both digital technology and international trade through universities, vocational colleges and enterprise training. Colleges and universities can set up digital trade related majors to cultivate innovative and applied talents with digital technology and international trade knowledge. Vocational colleges and enterprises can improve the practical ability of talents through training, internship and innovation and entrepreneurship projects. In addition, the government needs to improve the talent policy, attract overseas high-level talents to return home and start businesses, and provide intellectual support for the development of digital trade.

4.2.3. Improve the Digital Trade Governance System

Improving the digital trade governance system is the key link to promote the high-quality development of Digital Trade and enhance the toughness of the global value chain of manufacturing industry. The government needs to accelerate the improvement of the legal and regulatory system related to digital trade, clarify the ownership, use and transmission rights of data, and strengthen the protection of data privacy. At present, China's digital trade still has institutional weaknesses in data cross-border flow and intellectual property protection. To this end, we should improve the data exit security management system, standardize the cross-border flow mechanism of data, accelerate the promotion of hierarchical and classified management of data, and clarify the legal boundaries of data use. Promoting institutional openness is an important starting point for improving the digital trade governance system. Relevant departments should relax market access in the digital field, encourage foreign investors to expand investment in the digital field, improve the management mode of national treatment plus negative list before access, and promote the orderly opening of telecommunications, Internet, culture and other fields. At the same time, it is necessary to accelerate the construction of an

efficient and safe cross-border data flow mechanism to promote the orderly cross-border flow of data. In addition, we should actively participate in the formulation of international rules for digital trade, promote the accession to the digital economy partnership agreement (depa) and the comprehensive and progressive trans Pacific Partnership Agreement (cptpp), and enhance China's voice in the formulation of international digital trade rules.

4.2.4. Enhance the toughness of global value chain of manufacturing industry

In the context of global industrial chain reconstruction and digital transformation, improving the resilience of the manufacturing supply chain is the key to enhancing industrial competitiveness and coping with risks. The government needs to encourage manufacturing enterprises to optimize the supply chain layout through digital means, reduce the dependence on a single supplier, and improve the anti risk ability of the supply chain. Enterprises can establish a diversified supplier system, optimize the geographical distribution and types of suppliers, and reduce the risk caused by the interruption of a single supplier. At the same time, digital technology is used to build a supply chain risk early warning system to strengthen the identification ability of upstream supply risk and downstream market risk. In addition, strengthening industrial collaboration is the core path to enhance the toughness of the manufacturing supply chain. On the one hand, relevant departments need to establish a collaborative innovation platform to promote technical exchanges and cooperation between upstream and downstream enterprises in the industrial chain and realize the optimal allocation of innovation resources. On the other hand, the government should support large enterprises to play the "chain master" function, drive small and medium-sized enterprises to participate in division of labor and cooperation, and improve the overall synergy ability of the industrial chain.

4.2.5. Expand international cooperation and market space

In the context of the vigorous development of global digital trade, expanding international cooperation and market space is of great significance to enhance the competitiveness of China's Digital Trade and the resilience of the global value chain of manufacturing industry. On the one hand, China should deepen multilateral and regional cooperation and actively participate in and promote the negotiation of multilateral and regional digital trade agreements. Its modular structure design provides China with the opportunity to flexibly participate in international digital cooperation. On the other hand, China should actively promote the "belt and road" digital trade cooperation, strengthen cooperation with countries along the belt and road in digital infrastructure construction, and expand the export of digital products and services. Through the construction of the "digital silk road", China can jointly explore the governance rules of cross-border data flow with countries along the line on the basis of ensuring the interconnection of network infrastructure, and promote the implementation of digital economic cooperation projects. This will not only help improve China's voice in the

formulation of international digital trade rules, but also create a broader overseas market space for manufacturing enterprises and enhance their resilience in the global value chain.

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