Research on the Effect of China's Digital Economy on Global Value Chain

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Abstract. It is a fact that as a result of the developing new round of scientific and technological revolution and industrial transformation, nations all over the world must concentrate on the digital economy if they are to seize new opportunities for development and establish new competitive advantages. Businesses now face possibilities and difficulties as they deal with a new cycle of global value chain reconfiguration. The integration of digital technology has changed how individuals participate in global value chains and how they are geographically organized. As a new economic structure, it can encourage a significant driving force for economic and social progress and is a key factor in altering a nation's competitiveness. Additionally, it dramatically alters the geographical configuration of the value chain's division of labor to facilitate the growth of digitization, services, disintermediation, and manufacturing customization. This paper examines the status of China today, the participation and development of the digital economy, as well as the role and impact of the digital economy on China's global value chain. The study mentioned above is used in this paper to draw conclusions on the uneven development of China's many regions and the lack of adequate data governance, as well as to suggest workable solutions.

Keywords: Digital economy, global value chain, division.

1. The Situation of China's Digital Economy after COVID-19 Period

1.1. The Background Based on Development of Digital Economy after COVID-19 Period

As the production processes of goods span across enterprises and national borders, forming a fragmented layout on a global scale, the Global Value Chain (GVC) production model is increasingly becoming one of the primary modes for product manufacturing and service provision. In the pattern of global value chain division of labor, a country's trade gains are closely related to the production stages it undertakes. The differences in the embedded segments and relative positions of countries in the GVC not only impact a nation's profit-making capability but also concern the degree of control and benefit distribution within that country's value chain. Therefore, it is important to not only focus on a country's trade gains in the global production network but also emphasize the ability to expand domestic production processes and tasks through integration into the GVC, thereby nurturing a comprehensive industrial chain division system [1]. In recent years, some developed countries have implemented reindustrialization strategies to encourage the reshoring of manufacturing, leading multinational corporations to make significant adjustments to their international investment paths and value chain spatial arrangements. This has triggered a reconstruction and transfer of the GVC, resulting in the shortening or even interruption of certain value chain segments, endangering the integrity and security of production network systems. The COVID-19 pandemic outbreak and its subsequent worldwide spread in the past few years have highlighted the gaps in the global value chain's division of labor and the risks of production stages that are heavily reliant on it, leading to an international reexamination of supply chain security concerns. Meanwhile, digital technology continues to permeate and deeply integrate into various sectors of the national economy, altering traditional economic operation models. New economic forms such as smart manufacturing, new retail, and new entertainment are constantly emerging, providing significant driving forces for companies

to explore new points of value growth. More and more enterprises are accelerating their digital transformation, such as digital platforms, digital supply chains, and digital customer relationship building, reevaluating and adjusting their global production and operational layout, and propelling a new round of restructuring in the GVC [2]. The embedding of digital technology leads the GVC towards digitization, servicification, inter-mediation, elimination, and production customization, significantly changing the spatial layout of the global value chain division of labor.

1.2. The Significance and Importance of the Theme

The digital economy, an innovative economic framework that also promotes social and economic growth, has the potential to significantly alter a country's competitiveness. The Party's 20th National Congress declared that the full integration of the physical economy and the digital one ought to be supported and advanced. Gaining access to the latest round of industrial transformations and scientific and technical revolutions requires the promotion and growth of the digital economy. The digitalization of local industries can currently significantly improve China's position in the GVC by enhancing the production efficiency of various departments and therefore lowering costs [3]. The core competitive advantage of China's industrial chain lies in the ability to control key links and chains independently [4]. The use of technological innovation to open up new business opportunities encourages domestic businesses to actively seek out new ways to enter international markets, realize global economic activities, and strengthen industrial chain cooperation and inter-country dependence. As a result, trade between nations has developed quickly, and the international division of labor has been established, allowing each member state to engage in trade [5]. Therefore, GVCs are of great importance, and for a country, its position in the GVC directly affects its benefits in participating in the global production network [6].

2. The Relevant Conceptions and Connections of Digital Economy and GVC

2.1. The Multi-Perspective Conception of Digital Economy

For the definition of the digital economy, some investigators emphasize the importance of digital technologies in the digital economy [7]. As an economic pattern or external environment, the digital economy achieved digital interactions in the terminal or production phase of products after having endured technical revolutions like the internet, etc. Meanwhile, the digital economy is a kind of combination based on society and physical technologies. Other investigators tend to elucidate the digital economy from its peculiarities [8]. They believed that the essences of the digital economy are informationize, universalize, high additivity, high permeability, etc. High levels of digitalization are advantageous for realizing information flow, facilitating the creation of new commercial activities, and fostering the high-quality development of society. Meanwhile, other researchers think of the digital economy as having a dynamic perspective [9, 10]. The digital economy pertains to a historical category and shows brand new traits through interacting with other subjects. So, it cannot be simply regarded as a way of economic activity.

2.2. The Main Conceptions and Evolution of GVC

Michael E. Porter originally put forth the idea of a value chain in 1985. The Porter value chain initially focused on vertically integrated businesses and highlighted the competitive benefits of a single organization [11]. As multinational outsourcing enterprises grew, Porter expanded his study approach to include other companies and offered a new conception, the value system, in 1998. This notion shares certain characteristics with the concept of GVC in the future. Following that, Kogut also put up the concept of a value chain, and, unlike Porter, he saw a connection between the vertical breakdown of the value chain and the redistribution of space globally [12]. The research of Lv Yanfang, et al. put digital technologies into GVC when they first proposed the conception of digital global value chain. They described it as a set of economic activities that included the production of international value and viewed data as a crucial production factor. This will facilitate the deep fusion

of digital technologies and traditional value creation, as well as accelerate the process of digitizing value creation, including its subjects, objects, and methods. What is noteworthy is that the modality of the digital global value chain is changing and evolving. The digital global value chain is forming a greater and more complex value creation network through the combination of digital technologies. Correspondingly, its value creation logic is also evolving from a "chain" one-way value creation logic to a "chain-network-circle" complex digital value creation logic [13].

2.3. The Trinity of Global Trade, GVC, and Digital Economy

As economic globalization continues to advance, the value of the digital economy has become more apparent, and a new era of digital technology-driven global trade has begun. The digital economy fundamentally changed the whole space arrangement and value distribution in each part of the value chain. By exerting network connection impact, cost conservation effect, and value creation effect, industrial digitization modified the connecting manner of value chain division, promoted the link of each participant to be flatter, and influenced a country and the width and height of GVC in its specific departments [14]. The development of digital trade promoted digital products into GVC, changed the creative pattern and income allocation situation over the globe, and promoted the transition and reconstitution of GVC. The emergence of a new development paradigm that supports value chain circulation, dual national and global circulation, and favors domestic circulation as the primary body is all made feasible by the digital economy. Massive changes in global economic society are underway, so transnational corporations will attach more importance to the stability and safety of value chain division, while the adjustment and replacement of global value chain division become inevitable. According to the theory of Qin Qinghua et al., who examined the theoretical mechanisms of the influence of the digital "Belt and Road Initiative," relevant countries, and structured GVC division status Gini Index to examine the demonstration effect in various nations but the same industries [15]. The study indicates that there are more new cost patterns and new industrial forms that are based on digital technologies, and they create conditions for the domestic circulation of the value chain division.

3. Multi-perspective Research of Digital Economy in China and Value Chain

3.1. The Functions of Digital Economy Based on the Status of GVC

China needs to fully, accurately, and comprehensively implement the new development concept, stick to the path of socialist market economy reform, maintain a high level of opening up, and expedite the creation of a new development pattern with the domestic cycle as the main body and the domestic and international cycles mutually reinforcing, which was emphasized by the report of the 20th National Congress of the Communist Party of China. The profound connection between the physical economy and the digital one, as well as the acceleration of the digital economy's growth and the development of internationally viable digital industrial clusters, are also crucial. Currently, the core area of the digital economy has developed a growth pattern that emphasizes domestic circulation as the primary element and simultaneously enhances its international and domestic circulation. The industrial chain's significance keeps rising, and the domestic division of labor within the creation of digital products is greater. It also participates more deeply in the global cycle [16]. The digital industry has been deeply embedded in the industrial chain of various fields in China, promoting economic and social development in various regions. In recent years, unilateralism and trade protectionism have continued to rise, and the decline in investment activity and weak demand has led to a slowdown in cross-border trade led by GVCs, while the rise of the digital economy has played an important role in promoting globalization, which is reflected in increasing export vitality and improving trade efficiency [17]. Second, the digital economy revitalizes the world's price and value chains by promoting supply and demand matching, enhancing communication and cooperation, and supporting the close interconnection and coordinated growth of the value chain at home and abroad.

3.2. The Participation and Development of Digital Economy Based on Current Situation

In recent years, China has diligently implemented its national strategy for digital economic development, aiming to cultivate the digital economy as the fastest-growing, most innovative, dynamic, and widely influential sector in the country's economic landscape, thus driving profound transformations in the production and lifestyles of citizens. The digital economy is now a more stable new pillar and a major factor behind economic growth for modern national economic development. Applications of digital technologies have broken down numerous temporal and spatial constraints in the traditional GVC, enabling multinational corporations to enhance operational efficiency and scale, further leading to highly internationalized and specialized production and operational activities by these corporations. This has facilitated deep integration within the global business network and ushered in a new round of reshuffling in the GVC hierarchy. The digital economy has simultaneously reduced communication time and costs, sped up transaction processes, and optimized global resource allocation, bridging the information gap between various industrial chain segments. This has increased the scope and volume of national trade [18]. In light of this context, this paper first explores how the digital economy and China's manufacturing sector's position in the GVC are related. The document then suggests specific measures to improve China's manufacturing sector's standing abroad in the context of the global labor market. The objective is to strengthen China's position within the GVC and contribute to the superior development and transformation of its manufacturing sector.

3.3. The Analysis of Functions and Effects of China's Digital Economy to GVC

The value distribution in GVC may change into one of two situations in the era of the digital economy due to new technical advancements, which may present new opportunities or difficulties for decision-makers. The advantages that newly emerging economic organizations face include the chance to win in global value allocation and manufacturing under digital drive. However, there are challenges for these economic entities due to their position in the competitive market, so they need to maintain their previous leading statuses, which are inevitable impacts those entities have to deal with [16]. The value chain of domestic digital product manufacturing industries had passed into GVC, while a fluent international industrial chain promoted the development of domestic circulation, and product manufacturing turned into a large domestic market from an export orientation. Simultaneously, the promotion of the division level of domestic digital product manufacturing industries (the upgrade of domestic circulation) also facilitated their deep involvement of GVC (the optimizing of international circulation). China is paving the road of both domestic and international circulations right now, while digital trade laid the foundation of more export service trade and contributed to promoting the output of service trade. In addition, China is increasingly considered as the global leader of digital trade. Generally, the impact of digitization on global trade can be easily exaggerated, but it is ordinary to underestimate the long-term revolutionary potential of these technologies [19].

4. Drawbacks and Suggestions to China's Digital Economy in GVC

4.1. Drawbacks of China's Digital Economy in the Global Value Chain Division

China's digital economy accelerated development in the reverse trend, sinking to the county economy, all regions are actively taking measures to promote development, and have achieved initial results. However, there are still the following deficiencies: Firstly, the development of various regions is unbalanced and the gap is large. Secondly, the development quality is not high [20]. At the same time as the continuous jump in economic aggregate, our country is facing certain challenges at home and abroad. It is no longer acceptable to solely focus on increasing economic quantity; instead, there is a growing movement to encourage the shift from a quantitative to a qualitative economic development model. Thus, encouraging high-quality coordinated regional economic growth is a key objective of China's economic development in the new developmental stage. While the quick

advancement of digital technologies has made it easier to produce and run businesses, it has also presented new problems for China's ability to regulate. Data, a key component of manufacturing in the digital age, has both unlocked value and increased data security issues. For instance, data assets currently lack a clear and specific legal status, resulting in numerous challenges related to data ownership and control. Additionally, the prevalent existence of data barriers prevents timely data sharing and openness. Inadequacies in China's legal and regulatory frameworks in relevant fields have led to various risks in data application processes [21]. Therefore, it is crucial to advance the modernization of the system for governing the digital economy and to increase its effectiveness.

4.2. Suggestions about GVC for China's Digital Economy Based on Domestic Regional Situation

Due to the uneven development of different regions, it is essential to concentrate on the current stage of development, strengthen ties between different regions, speed up infrastructure improvement, pinpoint issues, and learn and implement new digital concepts [20]. In view of the low quality of development, each district needs to explore, find different characteristics of different regions, and accelerate the creation of products with different concepts and specialties. Accelerate the construction of a rationalized and comprehensive digital economy platform, so that all regions with unbalanced development have the corresponding knowledge, establish a sense of digital economy, and enable different regions to integrate into the digital economy faster. China will build a large unified national market and promote the efficiency of cross-regional allocation of means of production. Take in the sophisticated production variables from around the world and encourage the effective growth of double cycles both domestically and internationally. Breaking down traditional industry borders and fostering extensive industry integration, the replicable and inexpensive advantages provided by the Internet platform or big data can be leveraged to promote the digital alteration of the manufacturing ecosystem and the traditional production model [22]. Popularize the knowledge of e-commerce, and accelerate the creation of a rational and comprehensive e-commerce platform, so that it has a certain knowledge of e-commerce, so that Cheng County has the ability to integrate into the digital economy faster.

4.3. Suggestions about GVC for China's Digital Economy Based on International Enterprises & Industries Situation

First and foremost, improved data governance laws and regulations as well as legislation for data security and privacy protection are required at the national level. By leveraging the potential of extensive data platforms, a comprehensive, multi-level, and three-dimensional regulatory system should be established to effectively safeguard the privacy and security of national and corporate data. This involves executing the primary responsibilities of regulators in the digital economy risk domain and formulating policies, regulations, and standards that foster data sharing and openness. Secondly, a gradual approach should be adopted to open up public data. Clear data opening and sharing catalogs need to be developed. Initial steps should focus on progressively opening up data linked to industrial production, ensuring that enterprises have access to ample data for informed decision-making. From an industry standpoint, industry-specific guidelines and norms for data sharing and openness must be established [23]. This will ensure the seamless sharing and integration of data within each industry, thereby propelling the overall orderly development of industries. Encouraging leading companies within each industry to actively provide an array of digital services, typified by the industrial internet, to small and medium-sized enterprises will infuse fresh impetus into their digital transformation efforts. This support will, in turn, drive the digital enhancement of the entire industrial chain. Concurrently, companies should strengthen their data security management capabilities, adhere to data development and utilization compliance, establish robust data open-sharing platforms, and facilitate efficient circulation of industrial data within the industry. Augmenting the standardized management of industrial data applications will ensure that the advantages of various platforms are fully harnessed. It is crucial to protect consumer privacy rights from any potential violations while

also ensuring the security of company data. To capitalize on the digital revolution in technology, actualize China's transformation in manufacturing and upgrading, and advance in the GVC, China has to adjust its standing within the GVC to the new, demanding environment and change its strategic approach properly. There are regional variances in the degrees of digital economy development, so it is vital to coordinate its development. Furthermore, it's critical to optimize the geographical linkage spillover impact on GVC and employ regions with a more developed digital economy to propel the growth of regions with less developed economies [24]. With the quick rise of the digital economy, digital transformation will assist the upgrading of industries, the advanced and sensible development of the region's manufacturing structures, and the improvement of the position of the region's global division of labor in the GVC. China can encourage the combination of its industrial policy and innovation policy by adjusting the direction of both, guided by "functional upgrading," in order to foster the advancement of significant technologies and improvements in industry and realize a strengthening of the status of the GVC international division of labor. [25]. The sustainable growth of the digital economy requires the aid of creative and technologically astute employees in order to support the expansion of the global division of labor in the GVC. In addition to the support of policies, rules, and laws, talent is a major engine for the expansion of the digital economy. The demand for low-skilled workers in the past is gradually decreasing and the demand for high-tech and innovative skills is gradually increasing due to changes in industrial production technology and content. It is crucial to improve the professional discipline system in higher education, promote "industry-university-research" cooperation, enhance and connect multiple assets like research in science, higher education, and entrepreneurship manufacturing, cultivate professional talents, and deliver abilities to high-tech industries for the purpose to meet the requirements for the coming development of the digital economy.

5. Conclusion

This paper mainly discusses the present Chinese internal digital economy development situation as well as its functions and effects on the GVC, and proposes the conception of 'The Trinity of Global Trade-GVC-Digital Economy'. From this, the paper further elucidates the significant contributions of the digital economy to China’s value chain and GVC. To provide more guidance, this article also examines pertinent limitations and suggests solutions to address them in order to encourage domestic and international trade as well as the high-quality synergistic growth of the local economy. However, there are some inadequacies in this paper. The paper analyses current situations and puts forth prospects based on previous research and only in theories, which means lacking actual data as a basis. In this case, the research hopes that subsequent researchers can combine theories with practical data and further study the effects of China's digital economy on the GVC.

Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order.

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