

Digital Trade: Definition, Measurement and Development

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Abstract: As a result of economic globalization and advancements in digital technology, digital trade is rapidly developing. To begin, this paper examines several perspectives on the definition of digital trade. The paper then goes through the characteristics of digital trade development from four different perspectives: the input of production factors, improvement of production scale, consumer products supply, and trading platform upgrade. This paper also demonstrates the digital trade measuring approach and examines the issues with the measurement method. Despite the fact that the development of digital trade will face challenges such as impediments to digital trade, it is an essential study topic due to the enormous advantages it may provide. Finally, we summarize and prospect the digital trade.

Keywords: Digital trade; Development; Economic efficiency

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1. Introduction

With the close connection of the global economy and the profound development of digital technology, digital trade is booming. Modern information technologies such as the Internet, big data, and cloud computing have effectively promoted the “digital” transformation of trade. According to the measurement of the United Nations Conference on Trade and Development (UNCTAD), China’s digital trade volume increased from the US \$200 billion in 2015 to the US \$2947.6 billion in 2020, an increase of 474%. In the “14th Five-Year Plan,” China put forward the requirement of “enhancing the level of digital trade,” and will support Beijing and other places to take the lead in creating digital trade demonstration zones. According to the statistics of China’s e-commerce report, cross-border e-commerce, as an emerging form of trade, shows a rapid growth trend, from 36.02 billion yuan in 2015 to 169 billion yuan in 2020 (**Figure 1**).

With the gradual development of digital trade, its positive influence has gradually attracted high attention from countries all over the world ^[1]. The US International Trade Commission (USITC) pointed out in a report in 2013 that the impact of digital trade has led to the reduction of international trade costs and the improvement of productivity, which is expected to increase the growth rate of US gross domestic product (GDP) from 34% to 48% in that year. The above data illustrates the advantages and impact of digital trade. Digital trade has an important relationship with economic development and has important research significance. This article attempts to explain the definition, development characteristics, and related measurement issues of digital trade, and summarize the current development of digital trade and its

prospects to provide a reference for the academic community to study digital trade in depth.

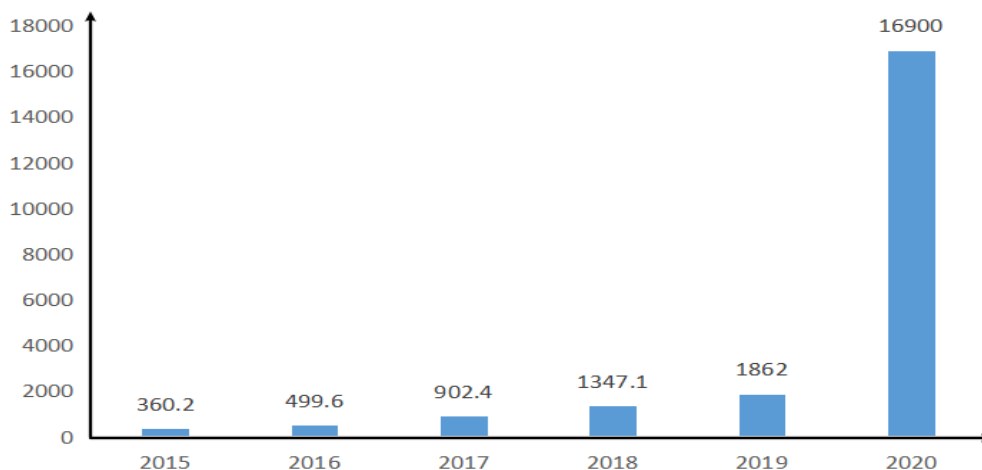


Figure 1. Total import and export volume of China’s cross-border e-commerce from 2015 to 2020 (RMB 100 million)

2. The definition and specific development characteristics of digital trade

2.1. The definition of digital trade

In 2013, the United States International Trade Commission (USITC) formally proposed the definition of “digital trade,” which is expressed as domestic business and international trade activities that transmit products and services through the Internet. In 2014, physical goods were included in its definition. Ivan sarafanov, Bai Shuqiang ^[2] defined digital trade in a narrow sense and in a broad sense: in a narrow sense, it refers to the provision of digital information required for trade subjects through digital exchange technology relying on the Internet; in a broad sense, four core factors, namely, the transaction of ICT products and services, digital products and services, personnel mobility and data transmission, are added to the concept of digital trade. OECD, WTO, and IMF (2020) define digital trade as all trade that is ordered and/or delivered digitally and propose a digital trade concept that includes 4 dimensions of trade scope, trade method, trade product, and trade subject Framework (see **Figure 2**). Sun Jie ^[3] paid attention to the purpose of digital trade and emphasized that digital trade should be a productive modern service industry to improve the efficiency of economic activities and optimize the structure.

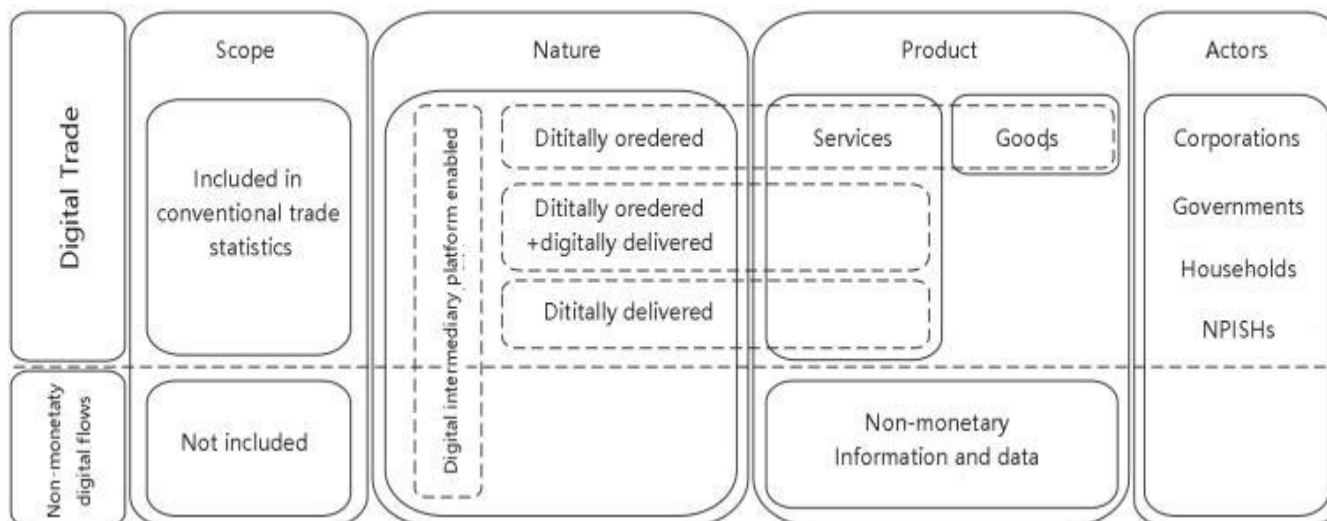


Figure 2. Conceptual framework of digital trade statistics

All the above studies show that digital trade takes digital technology as the carrier, promotes the exchange of physical goods, digital products, and services through digital delivery or digital ordering, and ultimately aims at improving the efficiency of traditional economic activities and optimizing economic structure. While paying attention to the definition, this paper also analyzes the specific characteristics of digital trade development from different perspectives, analyzes the problems existing in the current digital trade measurement, and gives countermeasures for the existing barriers to digital trade.

2.2. Specific characteristics of digital trade development

To have a more comprehensive understanding of digital trade, this article will summarize the specific development characteristics of digital trade from four aspects.

Firstly, from the perspective of input of production factors, digital knowledge and information are present in digital trade as key production factors. With the popularization, and upgrading of digital technology, the importance of knowledge-intensive capital related to digital technology has gradually increased. According to WTO (2018) estimates, from 2012 to 2016, when the average annual growth rate of global trade in goods and services was only 2.77%, the average annual growth rate of global information data flow could be as high as 149%. Digital information and related technologies can drive the rapid development of the digital economy and constitute a source of comparative advantage for digital-intensive product exports.

Secondly, from the perspective of increasing production scale, digital trade is promoting the production of small and medium-sized manufacturers to accelerate the formation of economies of scale. Digital trade weakens the restrictions on facilities, geography, and systems, and helps small and medium-sized enterprises realize economies of scale. Large developing countries rely on the huge economies of scale in digital-intensive industries to ensure their competitiveness in the international trade market. Abeliansky & Hilbert ^[4] found that ICT reduces transaction costs and affects global trade patterns. According to WTO, digital trade will increase the production efficiency of digital small and medium-sized enterprises in developing countries by more than 75%.

Thirdly, from the perspective of consumer goods supply, the supply of consumer goods in digital trade tends to be individualized and diversified. Digital information networks can effectively reduce consumers' searches and comparison costs, while manufacturers can use digital technology to measure consumer preferences and achieve personalized product customization. According to a study by Broda & Weinstein ^[5], the promotion of diversification of export products through mass customization can increase the proportion of US consumers' total imports in GDP by 26%. Respecting the personal needs of consumers, producing and supplying customized products and services has become one of the sources of competitiveness of foreign trade manufacturers.

Fourthly, from the perspective of trading platform upgrades, online platforms play an important role in coordinating and allocating resources in digital trade. According to UNCTAD statistics, the e-commerce retail sales of the world's top 10 cross-border e-commerce companies accounted for 46.5% of the global e-commerce retail sales in 2018. The world's top four cloud computing service providers account for more than 60% of the global digital delivery trade market. The digital platform can realize mutual consultation and information sharing by providing facilities and services for businesses, customers, logistics, and the government, forming a good trade ecology.

3. Defects and suggestions in the measurement of digital trade

The conceptual framework of the digital trade of the IMF and OECD is an authoritative system at present, which is mainly divided into three parts: digital order trade, digital delivery trade, and identification means of the digital intermediary platform (see **Figure 2**). However, there are still great difficulties in the statistical

process of this framework.

Firstly, digitally ordered trade is an international trade activity in which goods or services are completed through a computer network dedicated to receiving and sending orders. For digitally ordered trade, the existing statistical measures are mainly based on enterprise surveys and customs statistics. However, both of these measures have their drawbacks. Enterprise surveys may omit the distinction between domestic and cross-border e-commerce, or create the risk of double-counting by intermediaries. Customs statistics may omit small amounts of B2C digitally ordered goods trade or large amounts of B2B digitally-ordered goods trade, and the tariff reduction and exemption standards applicable to different modes of transport and different types of taxes vary from country to country ^[6].

Secondly, digitally delivered trade belongs to the category of service trade. UNCTAD's "International Trade in ICT-Enabled Services" statistical framework makes efficient use of existing statistical systems and data on trade in services and can calculate all trade in services that can be delivered digitally. UNCTAD defines international trade in ICT-enabled services as "services products delivered remotely over ICT networks" (i.e. over voice or data networks, including the Internet). It is limited to be provided through cross-border delivery. However, this approach may ignore other modes of network trade delivery beyond cross-border delivery. In addition, it is difficult to accurately calculate the intermediary service fees of platforms belonging to the digitally delivery trade, such as the intermediary service fees that may be hidden in commodity prices.

The unclear definition of digital trade and defects of the measurement methods of international digital trade measure digital trade need further discussion. Based on this, this paper gives the following three suggestions: first, while drawing lessons from the international digital trade statistics framework, countries should optimize the statistical caliber according to their reality, improve product classification, and avoid double counting and omission counting. And that range and the accuracy of data statistics are improved; second, on the basis of traditional trade, we should strengthen the monitoring and statistical methods of some new models and formats in digital trade, and pay attention to the development of emerging areas, such as cloud services, various digital intermediary services, digital finance and so on; third, government departments should maintain participation and influence in the international development of digital trade measurement methods and systems, and promote further cooperation among international organizations, the private sector, and academic institutions.

4. Development status, research significance and the prospect of digital trade

4.1. Main obstacles encountered in the development of digital trade

Barriers to digital trade have become the main obstacle to the promotion and development of digital trade. For the sake of national security and the protection of domestic enterprises, many countries restrict data flow by law, which will cause inconvenience and increase trade costs for enterprises relying on data flow for international cooperation and commercial trade. Localization requirements, data privacy and protection, intellectual property protection, and market access restrictions are becoming new barriers to digital trade.

4.1.1. Localization requirements

The digital localization measures adopted by some countries may increase the trade costs of foreign enterprises and even force them to withdraw from the market because it is difficult for them to meet the market needs of consumers. Bauer et al. ^[7] conducted a simulation analysis of eight economies with localization requirements, including the European Union, China, and South Korea, and the results showed that localization barriers will lead to a reduction of 0.7% to 1.1% in GDP and an average loss of 63 billion to 193 billion US dollars in welfare, which is far greater than the impact of traditional trade barriers. Meltzer ^[8] believes that the localization of data will increase the cost of accessing and using data, which will damage

the benefits of digital trade.

4.1.2. Data privacy and protection

At present, there are no unified legal provisions related to data privacy and protection in the world, and digital privacy and protection regulations vary from department to department, which makes the rules of data privacy and protection fragmented and complex. Janow ^[9] points out that the transmission speed of data flow in the context of digital trade is much faster than that of goods and services. The lack of cross-border data regulation can lead to serious consequences. According to EU statistics, the inconsistency of data protection policies will cause an additional \$3 billion in trade costs to European enterprises every year.

4.1.3. Protection of intellectual property rights

The Internet technology in digital trade facilitates the transmission of data and information, but it produces serious problems of network piracy and infringement. It is estimated that the total value of pirated digital music, movies, and software in the United States has increased to \$240 billion in 2015. In digital trade, the protection of digital trade caused by the incomplete rules of intellectual property infringement is not conducive to the development of digital trade activities. Safeguarding intellectual property rights is related to the sustainable and stable development of digital trade.

4.1.4. Market access limitations

According to USTIC (2014), in the digital communication sector, 75% of large companies and 44% of small and medium-sized enterprises regard market access restrictions as barriers to digital trade. Due to the different interests pursued by countries, it is difficult to reach an agreement on the trade rules of market access threshold for digital products. In 2011, IBM, Intel, and other Internet companies jointly released a report that lowering the market access threshold for digital products is conducive to innovation and economic growth, while data protection measures will increase the cost of enterprises engaged in digital trade.

According to the above discussion, this paper gives the following suggestions:

First, countries should clarify the concept and management mode of cross-border data flow in their laws. The concept of cross-border data flow should be defined to distinguish different situations of cross-border data flow, and the management measures that the government can take and the security protection responsibilities of relevant parties need to be clarified. Then, the responsibility and obligation of security protection of each digital trade subject should be clarified in the form of law.

Second, countries should strengthen the study of international digital trade and its rules, emphasize multilateral cooperation negotiations, and understand the new development of digital trade rules to prevent inadequate response to digital trade frictions and conflicts. Also, they should promulgate reasonable protection measures applicable to specific types or categories of data by negotiated updated standards.

Third, attention should be paid to the coordination of data free flow and national security review, data monopoly and fair competition, data information flow, and privacy protection to prevent excessive liberalization from causing losses to the state, enterprises, and individuals to build a fairer and safer environment of international digital trade.

4.2. Research significance

Digital trade not only creates new trade content, enriches the new trend of global trade, but also promotes the growth of the world economy and improves the welfare level of the people. Therefore, it is of important research significance.

(1) Digital trade helps to improve production efficiency, promote innovation and reduce trade costs. Digital

technology enables data and information to be transmitted rapidly around the world at nearly zero marginal cost while providing a modern logistics management system with high efficiency and low cost. Gonz Gonzalez & Jouanjean ^[10] believe that the sharing of data can reduce information asymmetry, improve the matching efficiency of trade supply and demand, and reduce the market cost of import and export. Using data from 51 countries, Xing ^[11] concluded that a 10% increase in Internet access leads to a 12% increase in bilateral exports of goods.

- (2) Digital trade helps to balance the global trade pattern and explore new forms and modes of trade. The sustained development of digital trade has had a far-reaching impact on the industries of all countries in the global value chain, helping to form a new situation of international competition. Jouanjean ^[12] found that before the development of digital trade, small enterprises in developed economies and developing countries were disconnected from global value chains. With the development of digital trade, small enterprises are gradually integrated into the global value chain. Digital trade is of great significance to the new form and mode of trade. Gonzdlez & Jouanjean ^[10] believed that digital trade created new ways for enterprises, consumers, and governments to interact, thus further accelerating trade among countries in the global value chain.
- (3) Digital trade helps multilateral trade negotiators to actively put forward trade proposals and governance rules that meet their own development needs. In January 2019, 76 WTO members issued the Joint Statement on Electronic Commerce. By December 2020, the number of participants had increased to 86, accounting for more than 90% of the world's total trade. Digital trade includes trade in goods, intellectual property rights, competition policy, data flow, consumer privacy, and other issues, and the results of these negotiations will have an important reference for other related negotiations. The negotiation of digital trade rules will help to build a unified and standardized global digital trade rules system. It helps to reduce barriers and obstacles that restrict the development of digital trade and helps countries to formulate and implement high-level trade liberalization policies.

4.3. Conclusion and prospect

This paper illustrates the definition and specific development characteristics of digital trade, and then analyzes the current authoritative statistical framework of digital trade and its defects and barriers to digital trade, and gives the corresponding suggestions. Finally, the research significance of digital trade is discussed. Based on the above discussion, the following conclusions are drawn:

Firstly, digital trade improves economic efficiency, promotes technological innovation, increases the welfare of consumers' diversified choices, is conducive to the development of trade in various countries, especially developing countries, and also contributes to the formulation and negotiation of global trade rules. Digital trade is likely to become one of the main forms of international trade in the coming decades.

Secondly, the development of digital trade is not mature, we still need to actively explore the relevant theories and rules of digital trade, and solve the problems that need to be solved urgently especially the measurement and trade barriers. In addition, only when mass production and consumption are digitalized and digital platforms are more popular and perfect, can the economic growth effect of digital trade be more apparent.

Third, digital trade is an irreversible wave that is the result of economic globalization and global infinite amount of information. Promoting digital trade and enhancing the related platform system would aid in the advancement of consumption, industrial transformation, and the betterment of people's living conditions.

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