

# Digital Trade Research Review: Connotation, Measurement Methods and Influencing Factors

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## Abstract

**Digital trade refers to the cross-border trade activities carried out through the Internet and digital technology. In recent years, it has developed rapidly and profoundly affected the global economic pattern. This research aims to thoroughly explore the significance and consequences of digital commerce, encompassing the methods used for assessments, a scrutiny of the barriers to digital trading, and the impact of its evolution on global commerce, economic situations, and policy formulation, in addition to suggesting strategies to enhance our country's digital commerce industry.**

## Keywords

**Digital Trade; Digital Technology; Digital Trade Measurement.**

## 1. Introduction

With the transition from the 20th to the 21st century, the expansive rise of the Internet and e-commerce signified the beginning of digital trade's rise. Globally, companies began to utilize the online space for electronic transactions and global trade, rapidly altering traditional methods of doing business and exchange. The rapid development of information technology, digital trade, as information technology swiftly advances and globalization intensifies, the significance of digital trade within the world economy has largely drawn growing focus and interest. In recent years, China's digital trade has developed rapidly. According to statistics, in 2022, China's digitally deliverable service trade will reach 2.5 trillion yuan, an increase of 78.6% from five years ago. As of 2022, the worth of China's global e-commerce in merchandise swelled to 2.1 trillion yuan, reflecting a 30.2% increase relative to the total from two years prior. The "14th Five-Year Plan for National Economic and Social Development and the Long-Term Objectives Through 2035," as put forth by government, unambiguously highlights the elevation of digital economic growth as a key objective in forthcoming developmental policies. We must make every effort to vigorously develop the digital economy. Data already exists as a vital factor of production in the process of economic growth. The surge in online commerce has played a substantial role in advancing the worldwide economic landscape, providing a considerable enhancement to trade productivity and markedly diminishing expenses, particularly benefiting small and medium enterprises (SMEs) as well as developing economies. Concurrently, the extensive adoption of digital solutions has notably fostered a climate of creativity and groundbreaking advancements in commercial strategies. At the same time, the widespread use of digital technology has greatly promoted the process of innovation and breakthrough progress in business models. Digital trade has made global value chains more complex and interconnected, and the supply chain management of products and services has been optimized and integrated, which in turn has effectively improved the efficiency and competitiveness of global trade. In-depth research on digital trade can help policymakers understand the economic, social and environmental implications of digital trade, so that they can develop policies and norms that drive healthy development and maximize their benefits. Analyzing electronic commerce entails grappling with vast streams of data, which aids in investigating methods to safeguard individual privacy and the integrity of data during international data transfers, as

well as in developing corresponding legislation and criteria. The development of digital trade may exacerbate the global digital divide to a certain extent, and it has become a crucial issue to study how to promote the inclusive development of society and gradually narrow the digital divide through digital trade.

At the end of the 20th century and the beginning of the 21st century, the popularization of the Internet and e-commerce was the beginning of the rise of digital trade, and global enterprises began to use the Internet for online sales and cross-border trade, and the digital trade model rapidly changed the traditional business model and trade mode. At the same time, digital payment and electronic transaction tools are also developing, making cross-border transactions more convenient for enterprises, which has promoted the further development of digital trade. With the gradual digitization of supply chains and the continuous advancement of logistics technology, products and services can be traded more efficiently and conveniently across borders. At the same time, scholars are beginning to define what digital trade is. In response to the needs of the development of digital trade, governments around the world have issued a series of relevant policies and regulations to support the facilitation and standardization of digital trade. Some scholars have studied the impact of regional digital trade rules, and Sun Yuhong et al. believe that RTA digital trade rules can significantly increase the flow of ICT product trade<sup>[1]</sup>, Zhao Jingyuan notes that when Regional Trade Agreements (RTAs) incorporate digital trade rules, there's a considerable boost in the trade of Information and Communication Technology (ICT) products. Additionally, these measures encourage an increase in exports with more domestic value within the digital industries of the participating countries. With the progression of digital trade, scholars are paying more attention to the digital trade status of these countries or regions<sup>[2]</sup>. With the development of digital trade, scholars have begun to pay attention to the level of digital trade in these countries or regions. How is the level of digital trade measured? What are the implications of digital trade for the global economy, trade and policy? What are the factors influencing the level of digital trade? This piece will explore the consequences of digital commerce on the international economic landscape, commerce, and regulatory frameworks, as well as the elements that shape the magnitude of digital commerce. It delves into the corpus of available literature on digital commerce to furnish answers to these inquiries. Initially, the article presents an exposition on what digital trade entails, focusing primarily on the evolution of its definition and the varying interpretations of digital trade within domestic and international contexts. The latter section presents how to measure digital commerce, with an increasing number of academics delving into its quantitative assessment. Therefore, reviewing existing research on this subject provides a clearer picture of the prevailing methods used to quantify digital trade and identifies potential advancement opportunities. The research's third segment delves into the effects of digital commerce, systematically analyzing both the impediments posed by digital trade barriers and the determinants that shape the advancement of digital trade.

## 2. Definition and Connotation of Digital Trade

At first, the concept of digital trade refers to e-commerce, because at that time, digital trade mainly refers to commercial activities and cross-border transactions through electronic means. The World Trade Organization's Second Ministerial Conference provides what is considered the initial conceptualization of digital trade, namely, the creation, distribution, or provision of goods or services through electronic channels.

In 2013, the United States International Trade Commission (USITC) released a document titled "Digital Trade in the United States and the Global Economy," which provided a foundational description of digital trade. This concept was defined as the process through which goods and services are distributed via digital networks, encompassing both wired and wireless mediums,

and covering transactions within the country as well as internationally [3]. Subsequently, the latter portion of the 2014 report by the United States International Trade Commission, named "Digital Trade in the U.S. and Global Economy," indicated that digital innovations play a vital role in commercial transactions, including the digital initiation of tangible goods deliveries. Yet, the report's 2017 version excluded this element, narrowing its scope to strictly digital transactions involving electronic payments. This version excluded the value of physical goods ordered online and those that correspond to digital forms. Three times, the definition of digital trade has undergone narrow-width-narrower changes<sup>[5][4]</sup>

In 2011, a domestic scholar proposed the definition of digital trade for the first time. Xiong Li proposed that digital technology should be relied on to provide digital electronic information needed for interaction between supply and demand, and digital trade can only be targeted in digital information. Li Zhongmin (2014) believes that digital trade is a new business form, new technology and new mechanism<sup>[5]</sup> According to Liu Hongkui (2020), earlier iterations of digital commerce were primarily concentrated on intangible digital offerings and products, excluding physical merchandise from its aims. This approach to digital commerce was deemed restrictive<sup>[8]</sup>. As the digital economy evolves, the scope and essence of digital commerce are broadening, centering increasingly on the integration of the Internet and digital technology in trade, and the definition and connotation of digital trade continue to improve and become more suitable for practical applications. In 2019, the OECD, WTO and IMF jointly issued the Digital Trade Measurement Manual, which pointed out that digital trade consists of "digitally ordered" and "digitally delivered". The Second edition of the Digital Trade Measurement Manual, published by IMF, OECD, UNCTAD and WTO in 2023, follows the definition and connotation<sup>[7]</sup>

The definition and connotation of digital trade by the Ministry of Commerce of China are the same as those of international organizations. The Ministry of Commerce divides digital trade into two main sectors: first, the trade mode with digital delivery as a prominent feature, and its trade object is data; Second, it is a trade method with digital ordering as a prominent feature, and under normal circumstances, cross-border e-commerce transactions are goods, but it is realized through digital ordering. According to the current definition of the scope of digital trade by international organizations and major economies, digital trade is regarded as an important branch of the existing trading system. This form of commerce intersects to some extent with conventional merchandise and service transactions, functioning as a method of trade and an item of digital commerce facilitated by digital technology. This degree of overlap is expected to increase further as digital technology continues to advance<sup>[7]</sup>.

It partially overlaps with the traditional trade in goods and services, and is a trade mode and a digital trade object with the help of digital technology. The digitization of trade methods and the digitization of trade objects. The digitalization of trade means that ICT is deeply integrated with all aspects of traditional trade, with the aim of significantly improving the efficiency of trade and effectively reducing costs. The digitalization of trade objects includes data and the trade of products and services in the form of data, which greatly expands the scope and depth of trade in services. Such a definition plays an important role in clarifying the specific scope of digital trade, and at the same time reflects the close relationship between digital trade and traditional trade<sup>[5]</sup>.

### 3. Literature References

Currently, academic methodologies employed by researchers domestically and internationally for examining digital commerce are primarily comprised of qualitative assessments, with the majority conducting qualitative evaluations of the effects stemming from digital trade. However, some scholars have begun to use quantitative analysis to study digital trade, explore how to

construct indicators to measure the development level of digital trade and digital trade barriers, and actively explore the use of empirical analysis methods to measure the level of digital trade.

### 3.1. Measurement Methods

LAN Qingxin (2019) selected relevant factors of digital trade competitiveness by using Porter's Diamond model, established an evaluation system and carried out empirical analysis. He believes that factors such as technology, talent and the level of opening to the outside world are crucial to the enhancement of China's digital trade competitiveness. Li Baomin and Zhu Sa (2020) adopted the VAR model to explore the relationship between China's digital trade and industrial structure optimization, and came to the conclusion that digital trade is helpful to optimize industrial structure, so they suggested vigorously developing digital trade. From the perspective of transaction costs, Chen Hongna (2020) analyzed the relationship between digital trade and cross-border data flow rules by using the gravity model. Wang Shijin et al. (2024) used the entropy method to build a comprehensive indicator system for the development level of digital trade in provinces from four aspects: digital infrastructure, digital innovation ability, digital industry and digital trade potential, and carried out an evaluation. In addition, they measured the export efficiency of each region through the stochastic frontier gravity model, and analyzed the impact of digital trade development on export efficiency in infrastructure construction and resource allocation by using the spatial Durbin model<sup>[9]</sup>. Wu Xuehong et al. (2024) A metric to assess digital commerce was formulated in 2024 by utilizing the principal component analysis method, after which the study scrutinized and corroborated the impact of progress in digital commerce on the expansion of the worldwide value chain in the manufacturing industry. At the same time, they further discussed the regulatory effect of financial development level on the length of global value chain of manufacturing industry by constructing a regulatory effect model<sup>[9]</sup>. In 2024, the research applied the Topsis technique, which incorporates the entropy weight approach, alongside the Dagum Gini index and spatial autocorrelation analysis, to examine and categorize the degree of digital commerce<sup>[11]</sup>. According to the methods used by domestic scholars for quantitative analysis of the level of digital trade, their measurement ideas are roughly the same. Firstly, some measurement indicators should be selected, and then entropy method, principal component analysis method and other methods should be adopted to construct comprehensive evaluation indicators of the level of digital trade, so as to obtain comprehensive evaluation indicators of the level of national or regional digital trade. Then, other measurement methods are adopted to study the influence of trade level on variables such as policy, trade and economy.

### 3.2. Selection and Range of Measurement Indicators

Different scholars have different approaches to the selection of indicators to measure the level of digital trade, and different indicators are selected to measure the level of digital trade according to the different objects, scopes and purposes of the research. With the chosen indicators varying based on the particular objectives, ranges, and aims of their studies. Zhang Yafei et al. (2024) selected four first-level indicators of digital technology application, digital trade mode, digital trade capability and trade potential to measure the level<sup>[11]</sup> Wu Xuehong et al. (2024) adopted the four first-level indicators of digital infrastructure, digital innovation, industrial digital trade and digital industrialization trade to measure the level of digital trade. All these methods of selecting indicators are useful for reference, but there is still room for improvement. These methods of selecting indicators have certain reference value and significance, but it cannot be ignored that there is also room for improvement. For example, there may be some unreasonableness in the selection of secondary indicators, or there may be a possibility that the secondary indicators can be further added or deleted. At the same time, in the process of constructing evaluation indicators, the important factor of research scope should also be fully considered. For example, the evaluation indicators obtained from the study of

multiple countries may not be applicable to the study of a certain country or region, so it is necessary to select indicators that are suitable for the actual situation of the study area.

In terms of the scope of quantitative research, some scholars study the world or select the relevant data of many countries for measurement, some scholars study the level of digital trade in a certain province or a certain country, Miao Chunyuan (2024) measured the development level of digital trade in Henan Province. She evaluated the level of digital trade in Henan province through five first-level indicators, including the construction of digital network infrastructure, logistics and transportation, digital trade capacity, digital technology innovation and trade potential, and analyzed the development trend from 2017 to 2021 with the entropy method<sup>[12]</sup>. Wang Mingyan et al. (2023) established a measurement system for the development level of digital trade, and evaluated the development level of digital trade in Hainan Province from 2010 to 2021<sup>[13]</sup>. In order to build an indicator system, Zhao Jiawen (2023) selected 5 first-level indicators and 17 second-level indicators to measure the development level of digital trade in Jiangsu Province from 2013 to 2021 by entropy method<sup>[14]</sup>. Hou Jie et al. (2023) used the entropy method to evaluate the development level of Russia's digital trade, and at the same time used the grey relational degree model to conduct an empirical analysis to explore the factors<sup>[15]</sup>

## 4. Study on the Impact of Digital Trade

As for the impact research of digital trade, this paper mainly combs the impact research of digital trade barriers and the influencing factors of the development level of digital trade.

### 4.1. Research on the Impact of Digital Trade Barriers

Regulatory barriers in the online sphere are recognized as a collection of constraints imposed by countries on the movement of both physical and non-physical commodities and offerings carried out through electronic channels within the international goods and services market. These obstacles to electronic business can have a negative impact on the transactions involved in digital trade.

There are two main reasons for the emergence of digital trade barriers, the first reason is that trade protectionism will bring discriminatory policies, and the second reason is that the digital trade supervision and management policies and regulations of various countries or regions are heterogeneous, and these policies and regulations are unpredictable. Looking at it through the lens of categorization, barriers to digital commerce typically encompass both nontariff and tariff obstacles. Tariff-related hindrances specifically lead to higher expenses in digital trade by imposing taxes on digital products and those associated with digital commerce, thus raising the cost of trade. This, in turn, impedes the international exchange of data and limits access to markets. Trade impediments that do not involve tariffs are commonly described as "behind-the-border" barriers, and they are more difficult to identify and measure compared to their tariff counterparts. These barriers typically take the form of prejudiced policies, regulations, and various methods that hinder the unrestricted movement of data across national boundaries, mainly reflected in the fact that digital trade must comply with the requirements of local policies and regulations, cannot infringe on others' intellectual property rights, the level of policy consistency between countries or regions, audit systems and cybersecurity.

The existence of digital trade barriers can adversely affect employment growth, business innovation of SMEs and data processing companies, and at the same time, have a negative impact on domestic GDP growth. Digital trade barriers can also affect the production performance of downstream industries, and digital trade barriers can reduce the volume of import and export trade in most sectors that trade in the global market. Particularly within the services trade sector, trade in such services is significantly influenced by barriers in digital

commerce, which may lead to restrictions on the import and export of digital services, and digital trade barriers also play an important role in regulating the impact of digital technology on the import and export of digital services. Moreover, these digital commerce obstacles are crucial in shaping how digital technology affects the trade of digital services internationally. In addition, digital trade barriers may further complicate import and export trade, and digital trade barriers will adversely affect the volume of China's export trade and the price of exported goods, thereby affecting its international trade competitiveness and economic growth potential.

#### **4.2. Factors Influencing the Development Level of Digital Trade**

To a large extent, the level of digital trade will be significantly affected by the support of digital infrastructure and technology, such as the coverage of Internet broadband, the development and construction level of infrastructure such as electronic payment platforms and big data centers. If the infrastructure is not sound and perfect, it will inevitably have a negative impression on the development of digital trade. In fact, one of the most important factors for the thriving of digital trade is the advanced and complete digital infrastructure and the excellent level of digital information technology.

The policy and legal environment is undoubtedly also a pivotal factor affecting the level of development of digital trade. If a country or region has friendly policies and a good legal environment for digital trade, especially in terms of trade policy, data protection law, intellectual property protection, etc., it has a sound and reasonable legal framework and a friendly institutional atmosphere. Such friendly policies and regulations will strongly attract and support companies from other regions to conduct digital trade in the region, and at the same time, it will continue to promote the improvement of relevant policies and regulations in the region, including the legal framework of trade policies, data protection laws, intellectual property protection, etc.

Talent with professional skills related to the digital economy and trade is an indispensable element in the development of digital trade. Therefore, we should vigorously cultivate outstanding talents with professional skills such as digital marketing, data analysis, and e-commerce management. Consequently, it is imperative that we actively foster exceptional individuals proficient in specialized competencies like online marketing, statistical evaluation, and digital trade administration. Consumer and business appetite for digital offerings, alongside their propensity to engage in e-commerce through online marketplaces, will have a direct and significant impact on the evolution of the digital trading landscape.

The progression of digital commerce will be significantly influenced by the framework and execution of global trade strategies and collaborative partnerships. This includes the establishment and application of both bilateral and multilateral trade pacts as well as agreements regarding the flow of data across borders, under normal circumstances, digital trade between countries that have signed trade agreements tends to be more convenient and smooth, which will greatly promote the development of digital trade between the two sides.

The soundness of the economic and financial system will also have a significant impact on the development of digital trade. A sound economic and financial system can provide essential support for the financing, payment and risk management of digital trade. The level of digital trade will be affected by the level of digital infrastructure and technical support, such as the coverage of Internet broadband, the level of development and construction of infrastructure such as electronic payment platforms and big data centers. If the construction of infrastructure is not sound enough, it will affect the negative impression of the development of digital trade, and a key factor in the development of digital trade is the advanced digital infrastructure and the level of digital information technology.

Consumers' and businesses' demand for digital products and services, as well as their habits of adopting digital platforms for buying and selling, will directly affect the level of development of digital trade.

International trade policies and partnerships will also have an important impact on the level of development of digital trade. For example, the formulation and implementation of bilateral and multilateral trade agreements, cross-border data flow agreements, etc., will generally facilitate digital trade between countries that have signed trade agreements, which will promote the development level of digital trade on both sides.

The level of development of digital trade is also affected by the soundness of the economic and financial system, which can provide necessary support for the financing, payment and risk management of digital trade.

## 5. Conclusion

The definition and connotation of digital trade in the academic community have been in the process of continuous improvement. At the beginning, digital trade was simply defined as e-commerce, and then the definition of digital trade was continuously expanded and extended, and the definition of digital trade has gone through a tortuous process from wide to narrow and then wide. The definition of digital trade given by China's official authorities is broadly similar to that of international organizations. The development of digital trade is closely related to globalization, so it is indeed necessary to have a unified and standard clear definition of digital trade, so as to benefit the good development of digital trade. Pertaining to the approaches for quantifying digital commerce, the conceptual frameworks proposed by academics are largely homogeneous. This involves the initial meticulous selection of indicative measurement metrics, followed by the application of rigorous techniques including the entropy method and factor analysis. Develop a framework for the exhaustive assessment of the digital commerce intensity, with the aim of deriving a holistic evaluation metric for a country or region's digital commerce intensity, thereafter employing alternative quantification techniques to analyze the influence of commerce intensity on policy, commercial activity, economic factors, and additional variables. However, scholars have not formed a unified standard for the construction of indicators, which is related to the selected research objects, but in some studies, there is indeed room for improvement in the construction of indicators. The paper delves deeply into a comprehensive review of studies related to the impacts of obstacles to digital commerce and the factors influencing the development of e-commerce's sophistication. Barriers in online trade are inevitably going to negatively impact the growth and performance of digital market transactions. digital trade, and the development level of digital trade will be affected by many factors such as the level of digital infrastructure construction, the friendliness of policies and regulations, the strength of consumer demand, and the signed trade agreements. Under the particular circumstances that characterize the nation, China has the potential to dynamically cultivate its own distinctive digital commerce, offering fresh paradigms and innovative approaches to the evolution of digital trade. It falls upon the authorities to persist in enhancing pertinent regulations and to fortify the framework governing legality, such as by advancing the infrastructure of digital financial transactions. Enhancing the skills and learning of those specializing in the digital economy is crucial, forging both two-sided and many-sided pacts that support digital commerce, advancing the ease of international exchange for digital goods and services, and fostering the worldwide growth of digital trade. Concurrently, safeguarding data integrity and ensuring confidentiality are imperative; forging a robust framework of laws to this end, fostering mutual confidence among trading partners, and stimulating an expansion in the volume of electronic exchanges is essential. We will vigorously support digital trade-related enterprises in innovation and entrepreneurship. Create a robust system for regulation and

oversight that guarantees fairness in online commerce, fosters the growth of the digital economy at a swift pace, and encourages the advancement of the digital economy with a focus on excellence. Accelerate the development of digital trade.

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