Analysis of Digital Services Trade and Export Competitiveness

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Abstract. With the accelerating development of digital economies worldwide, service trade is accelerating its transition to online delivery and platform-based models, driving profound changes in the structure of regarding global trade and labor specialization within global value chains. Especially against the backdrop of increasingly frequent cross-border data flows, digital service trade has gradually become a key indicator of a nation's export competitiveness. This paper examines the relationship between digital services trade and export competitiveness by reviewing relevant definitions, theoretical mechanisms, and institutional barriers, summarizing domestic and international research progress, and focusing on analyzing China's practical pathways and shortcomings in institutional development, technological innovation, and market expansion. The study finds that China needs to systematically strengthen efforts in areas such as rule-making participation, platform construction, support for enterprises going global, and data governance aimed at improving its competitiveness in the international digital services sector. This research provides theoretical support for optimizing China's policies governing digital trade as well as narrowing the gap with members of high-standard trade systems, while also offering new perspectives on the transformation pathways for services trade in the context of the digital economy.

Keywords: Digital services trade; export competitiveness; cross-border data flows; institutional development; technological innovation.

1. Introduction

In recent years, with the rapid development of information technology, the digital revolution has profoundly transformed the way global trade operates, propelling the service trade into a new phase of development. Digital service trade, characterized by low marginal costs, strong scalability, and weak spatial dependence, has emerged as a key driver of international trade upgrading. It has broken through traditional geographical and infrastructure constraints, enabling economies of all types—whether developed nations or emerging markets—to enhance their digital capabilities and thereby optimize their export structures and boost their competitiveness. Globally, developed countries including the United States and Germany maintain a leading position in the export of digital content and professional services. However, scholars have observed that developing countries like India and China demonstrate significant comparative advantages in sectors such as telecommunications, computer, and information services, forming a complementary global division of labor [1]. Nevertheless, in terms of overall scale and competitiveness, there remains a notable gap between developing and developed countries. As a rapidly developing major developing country in the digital economy, China has seen a continuous expansion in the scale of its trade in digital services over the past few years. However, it still faces numerous challenges in terms of its capacity to provide high-end services and its influence in shaping international rules.

Against the backdrop of accelerating global digitalization trends, Strategies to improve the competitive edge of China's digital services exports for advancing the high-quality growth of its foreign trade has become an urgent and important issue requiring in-depth exploration. This paper will examine the fundamental concepts and classifications regarding digital services trade in terms of both theoretical and practical viewpoints, analyze the mechanisms linking it to export competitiveness, and explore pathways for improvement in areas such as technological innovation, institutional environments, and market expansion, taking into account China's current developmental characteristics. Additionally, this paper will address the primary institutional barriers currently faced,

such as platform monopolies, data circulation barriers, and discrepancies in international rules, aiming to provide theoretical references and policy insights for China to build a more resilient and open service trade system in the digital economy era.

2. Literature Review

2.1. Concept and Categorization of Digital Services Trade

Despite the absence of a universally recognized definition for digital services trade, there is general agreement on its fundamental characteristic of cross-border delivery via information and communications networks. However, there is no consensus on the specific categories and scope of services. The Organization for Economic Cooperation and Development (OECD) focuses on digital service content represented by e-books, software, and databases, with the core being "digitized services delivered via networks," excluding data service goods; The United Nations Conference on Trade and Development (UNCTAD) adopts a broader definition, encompassing all services that can be remotely transmitted via voice and data networks, emphasizing the "service" as a whole without distinguishing between subcategories; the China Academy of Information and Communications Technology (CAICT) further expands the definition's boundaries, including not only traditional digital services but also the international movement of "data itself" as a measurable trade activity, emphasizing the trend toward the commodification of data elements[2-4]. Compared to traditional services trade, digital services trade does not rely on the cross-border movement of personnel or goods but instead relies on network transmission to complete service delivery, thus possessing characteristics such as virtualization, low cost, high efficiency, and cross-regional reach. In terms of classification, relevant scholars currently generally adopt a digitalizable classification for digital services trade. This includes nine categories such as communication services and computer services that involve digital delivery, serving as the basis for current statistical calculations of digital services trade [3,5].

2.2. The Basic Meaning of Export Competitiveness

Export competitiveness refers to the competitive ability of a country or region's products or services in the international market, encompassing both price advantages and non-price factors such as quality, technology, and brand. In the field of services trade, export competitiveness is not only reflected in cost control capabilities but also in innovation, professionalism, and added value of services. The export competitiveness of digital services trade relies more on technological strength, platform capabilities, data processing efficiency, and continuous innovation.

To conduct quantitative analysis of export competitiveness, various measurement methods are commonly used in research. One such method is the Revealed Comparative Advantage Index (RCA), which measures the proportion concerning a certain product or service within a country's export profile compared with the global norm. RCA>1 indicates a comparative advantage. Another is the export growth rate, which reflects the export performance and development potential of a particular service. Additionally, there are indicators such as the industrial technology complexity index, which measures the technological content and value-added level of exported products, and the market diversification index, which assesses whether exports are overly reliant on a single market, thereby evaluating risk-resilience. These indicators provide a foundational framework for identifying and enhancing the export competitiveness of digital services.

2.3. Mechanism of Action

As information and communication technologies evolve, digital services trade has become an increasingly vital factor in enhancing export competitiveness. From one perspective, digital services trade achieves cross-border delivery through information technology, significantly reducing the intermediary costs and communication barriers that exist in traditional trade, thereby improving the efficiency and flexibility of service delivery. From another perspective, online platforms and remote

service models provide small and medium-sized enterprises with new channels to enter international markets, lowering participation barriers and enabling them to bypass traditional trade channel barriers to directly target overseas customers, expand market space, and enhance overall export participation and diversity. Additionally, digital services are accelerating integration with traditional industries such as manufacturing and agriculture, giving rise to new export models like “software + hardware” and “cloud platform + equipment,” which are conducive to promoting industrial upgrading and optimizing the export structure. Building on this, as data becomes a key production factor, enterprises can leverage user data and platform algorithms to drive service innovation. Simultaneously, they can enhance user loyalty through the platform's network effects, thereby strengthening their brand influence and sustainable competitive capabilities in global markets, and further consolidating their competitive position in the international arena.

3. Pathways to Enhancing the Competitiveness of Digital Services Trade Exports

As the global economy accelerates its digital transformation, a new form of trade has emerged in the digital services sector, serving as an engine driving the high-quality development of China’s foreign trade. In the face of intensifying international competition, China must adopt a multi-dimensional approach, integrating technological innovation, institutional development, and market expansion, to comprehensively enhance the competitiveness of the country’s digital services trade as a whole.

3.1. Strategies for Technological Innovation and Industrial Upgrading

Technology is the primary driving force behind the development of digital services trade. Currently, state-of-the-art technologies such as artificial intelligence, distributed ledger, and cloud platforms have become important supports for the transformation and upgrading of service trade. China should increase R&D investment in these areas, particularly in core underlying technologies, to achieve self-reliance and avoid dependence on others. At the same time, it should use industrial integration to function as a lever for the purpose of enhancing the deep integration of traditional manufacturing with digital technology, actively developing emerging industries such as industrial internet services and smart manufacturing solutions, and enhancing the technological content and added value of service supply.

In addition, cultivating “specialized, refined, distinctive, and innovative” enterprises are key to enhancing competitiveness in niche markets. In niche digital service areas such as cross-border payments, digital copyright, and telemedicine, policy guidance and financial support should be used to encourage small and medium-sized enterprises with technological advantages and innovative capabilities to specialize and strengthen their businesses, cultivating a group of hidden champion enterprises with influence in the international market and further enhancing China's position in the global value chain of digital services.

3.2. Optimizing the Institutional Environment and Aligning Rules

The sustainable development of digital services trade relies on the existence of a robust and reliable institutional environment. First, to support the sound development of the digital economy, domestic legal and regulatory frameworks are required to be further improved. In parallel, a scientific mechanism for data classification and hierarchical management should be put in place, stronger safeguards for personal information and enterprise data security introduced, and a stable as well as predictable institutional environment established for digital service enterprises. Concurrent measures are needed to enhance the safeguarding of intellectual property, with particular emphasis on software-related areas, algorithms, and content creation, and accelerate the construction of mechanisms for intellectual property rights confirmation, protection, and enforcement.

At the international level, China should take an active role in developing and negotiating regulations related to digital trade and promote its accession to high-level digital trade agreements such as the Digital Economy Partnership Agreement (DEPA) to better integrate into the global digital economy system. Furthermore, leveraging the “Belt and Road” initiative platform, regional digital cooperation mechanisms should be established to promote institutional coordination and interoperability among countries along the route in fields such as cross-border data flow, digital service standards, and regulatory mutual recognition, thereby providing institutional support for Chinese digital service enterprises to expand overseas.

3.3. Market Expansion and Brand Building

At the market level, China's digital service companies need to consolidate their market share in traditional markets such as Europe and the United States while accelerating expansion into emerging markets. In particular, regions such as Southeast Asia, the Middle East, and Africa are showing tremendous potential for service trade as digital infrastructure development and internet penetration rates rise. Companies should be encouraged to tailor their offerings to local needs, providing localized and differentiated digital solutions to enhance the adaptability and competitiveness of their products and services.

In terms of brand building, domestic companies should be guided to focus on enhancing their international operational capabilities. This can be achieved through participating in overseas digital service exhibitions, establishing overseas R&D centers and service nodes, and other means to enhance global customer recognition and trust. Additionally, leading companies should be supported in building global service networks with platform ecosystem attributes, fostering a group of digital service platform companies with international influence in fields such as cloud services, digital education, and fintech. This will facilitate China's transition from a “digital service powerhouse” to a “digital service superpower.”

4. Current Challenges and Institutional Controversies

The fast expansion of digital services trade has benefited from globalization and the deep integration of information technology, but the increasingly high barriers to digital services trade pose a serious challenge to its development. Obstacles to trade in digital services refer to various inhibiting measures imposed by a nation’s government on trade in digital services trade based on its interests, which are an extension of traditional trade barriers in the digital age [6].

4.1. Platform Monopoly and Market Inequality

In the current global digital service trade market landscape, large multinational platform companies control key links such as service distribution, data control, and payment systems, exhibiting a strong tendency toward monopoly. These platforms typically possess advantages such as technological leadership, a broad user base, and high brand recognition, placing local companies, especially small and medium-sized enterprises, at a disadvantage in competition. Additionally, Small and Medium Enterprises (SMEs) generally face challenges such as insufficient data resources, weak technical capabilities, and opaque platform rules, making it difficult for them to obtain sufficient exposure and transaction opportunities, thereby further widening the gap with leading platforms.

4.2. Regulatory Barriers to Cross-Border Data Flows

Since the 21st century, digital services trade has grown rapidly, but its development has also sparked heightened concerns in some countries regarding national data security and the protection of domestic digital industries. As a result, regulatory barriers to the flow of data across borders have gradually appeared, becoming an important variable influencing the global economic and trade landscape. Issues such as data localization and privacy protection have garnered increasing attention [7,8]. Related scholars have found that regulatory constraints on cross-border data flows increase the

difficulty for businesses to obtain and transmit information, or prevent them from accessing sufficient consumer feedback, thereby raising the overall costs of digital services trade in multiple ways [9]. For example, as a typical regulatory barrier to cross-border data flows, data localization requirements restrict businesses from freely transmitting and storing data globally, thereby impacting the quality and delivery efficiency of digital services [10].

4.3. The Lagging Nature of Traditional Trade Rules and Inconsistencies with Digital Trade Rules

The traditional international trade rules system originated in the industrial age and primarily serves the cross-border flow of tangible items and fundamental services, posing challenges for adjusting to modern digital trade, which is centered on data as its core element. Although digital technology is reshaping the global trade landscape, the current rules system lags behind practice within sectors including digital payments, cross-border data flows, and smart contracts, making it difficult to provide effective institutional [11]. Meanwhile, the global community has yet to establish a unified digital trade rules framework. WTO e-commerce negotiations have stalled for years due to disputes over data sovereignty and digital taxes, while regional agreements vary in their standards for digital provisions, exacerbating the fragmentation of global governance [12]. In this context, although China has actively participated in multiple free trade zone negotiations, it remains in a relatively passive position in the formulation of global digital trade rules, with its participation and influence in this area requiring further enhancement. Overall, there is a significant mismatch between the current development of digital trade and the traditional rules system, necessitating urgent efforts to update rules and reconstruct international cooperation mechanisms.

4.4. Shortcomings in Domestic Development

Domestically, the growth of China's digital services trade also faces some deep-seated issues. First, the existing services trade statistical system is still incomplete, lacking accurate statistics on the subcategories and traffic of digital services, which constrains policy formulation and effective evaluation. Second, issues such as a shortage of high-end digital services talent and insufficient innovation capabilities persist, particularly in fields such as artificial intelligence, cloud computing, and fintech, where there remains a gap compared to international advanced levels. Additionally, regional development is uneven, with some central and western regions lacking robust digital infrastructure and low levels of corporate participation, making it difficult for them to share the benefits of digital trade development.

5. Conclusion

A literature review approach is adopted in this study to analyze systematically the connection between digital services trade and export competitiveness, summarizing the core perspectives and analytical approaches from existing research. It further elucidates the intrinsic mechanisms and external constraints through which digital services trade enhances export competitiveness, specifically manifested in the following aspects: First, the rapid development of digital technology has introduced new methods for cross-border service delivery, driving the optimization of service product structures and the enhancement of value-added components; Second, platform-based and remote transaction models have expanded the participation space for small and medium-sized enterprises, enhancing the diversity of export markets; Third, data resources, as a new type of production factor, are reshaping the international trade division of labor landscape, imposing higher demands on technological capabilities, platform governance, and rule-setting authority.

On this basis, the article points out that China still faces challenges in enhancing the competitiveness of its digital service trade, including insufficient technological innovation capabilities, relatively lagging rules and regulations, and rising barriers to data flow. It suggests taking the following measures to address these challenges: first, accelerate the research and development of

key digital technologies and promote industrial integration to enhance the added value of services; second, Secondly, strengthen the national legal framework, take an active role in shaping international regulatory standards, and enhance institutional adaptability and international influence; third, promote the balanced regional layout of digital infrastructure, strengthen support for SMEs going global, and enhance overall service trade competitiveness.

Future research could further focus on the mechanisms through which data elements contribute to export competitiveness, explore the heterogeneous impacts of different types of digital services, and, in conjunction with current trends toward green transformation and intelligent development, identify the export potential and development pathways of emerging fields such as green cloud computing and artificial intelligence services, thereby providing theoretical and policy support for the high-quality development of China's digital services trade.

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