



Cross-Border E-Commerce Competitiveness Research Report

——Country-Level Analysis

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Preface

The world is accelerating the unprecedented changes unseen in a hundred years, with profound and complex transformations in the international landscape. Cross-border e-commerce continues to demonstrate strong growth, emerging as a highlight of global economic development. To further assist countries in creating a business environment conducive to the growth of the cross-border e-commerce industry, the World Internet Conference (WIC), leveraging its role as an international organization, has partnered with its member units and the WIC Working Group on cross-border e-commerce, along with industry think tanks, academic institutions, and enterprises, to conduct research on cross-border e-commerce competitiveness and produce a series of reports. These reports focus on **countries, platform enterprises, and logistics companies**.

This report presents research on cross-border e-commerce competitiveness at the **country level**. It examines 55 sample countries across six continents, constructing an index system to measure competitiveness based on two dimensions: **business environment** and **industry competitiveness**. The report quantifies these indices using official data, industry surveys, and expert interviews, applying methods such as the Analytic Hierarchy Process (AHP) to systematically analyze the data and assess each country's competitiveness. The findings are then thoroughly analyzed.

The report's key findings on cross-border e-commerce in countries are as follows: In terms of **business environment**, a well-developed and predictable legal and regulatory framework is a key safeguard for growth, while formulating and participating in international rules serves as a major driving force. Lowering customs clearance costs and improving public services can attract more participants to the cross-border e-commerce sector. Regarding **industry competitiveness**, digital infrastructure significantly promotes the upgrading of cross-border e-commerce industries, modern logistics systems help cross-border e-commerce enterprises integrate more effectively into global trade, and universal digital literacy is a key factor in driving cross-border e-commerce development. Strengthening enterprise capacity can further enhance the vitality of the cross-border e-commerce industry.

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01 Major Conclusions

Cross-border e-commerce has transformed traditional international trade models and operations, significantly influencing the global economic and trade landscape. Through cross-border e-commerce, businesses and consumers around the world are now more closely connected than ever before, which has fully unlocked the potential of global trade. The development of cross-border e-commerce not only meets diverse consumer demands but also creates new opportunities for developing countries and small and medium-sized enterprises (SMEs) to participate in the global economy. This report examines the competitiveness of cross-border e-commerce in 55 countries, to summarize successful experiences, which will

help countries optimize resource allocation, establish differentiated competitive advantages, and expand the space for international trade development. The key conclusions and findings are as follows:

(I) A well-developed and predictable legal and regulatory framework is a key safeguard for growth

A clear, stable, and predictable legal and regulatory framework can provide cross-border e-commerce businesses with a defined institutional framework, reducing uncertainties and risks arising from changes in laws and policies. For example, clear market entry policies for cross-border e-commerce can enhance policy transparency and encourage greater participation by SMEs in cross-border e-commerce. A well-structured legal and regulatory framework also facilitates various transaction stages, such as contract fulfillment and tax refunds, expediting the intelligent and efficient handling of cross-border logistics. Countries with stronger cross-border e-commerce competitiveness generally

have more robust commercial legal systems that encompass the entire chain of processes—covering electronic contracts, electronic signatures, electronic payments, and cross-border logistics—thus supporting regulated growth in cross-border e-commerce. In recent years, emerging markets and developing countries, exemplified by China, have also been actively advancing their legal and regulatory frameworks for cross-border e-commerce.

● **Column 1: China Develops "Positive Lists" to Promote Cross-Border E-Commerce Retail Imports**

China has been an early explorer and promoter of cross-border e-commerce trade facilitation. In 2016, China introduced "Positive Lists" for cross-border e-commerce retail imports, which has been refined in recent years. This list includes items such as food and beverages, clothing and footwear, household appliances, cosmetics, diapers, and children's toys, with periodic adjustments based on the development of cross-border e-commerce and evolving consumer needs. This initiative not only meets domestic consumer needs in China but also significantly boosts exports from other countries to China, creating a win-win situation where both Chinese consumer welfare is enhanced and other countries' exports grow.

(II) Participating in international rules can enhance the domestic legal and regulatory framework for cross-border e-commerce

Many sample countries actively participated in the World Trade Organization (WTO) Joint Statement Initiative on Electronic Commerce (E-Commerce JSI) and are involved in e-commerce negotiations, hoping to reduce trade barriers by aligning with WTO rules. Numerous developing countries in the sample have enacted legislation based on or influenced by the *UN Model Law on Electronic Signatures* (MLES), *Model Law on E-Commerce* (MLE), and *Model Law on Electronic Transferable Records* (MLETR), intending to leverage these UN model laws to establish their own national e-commerce regulatory frameworks. However, only a few countries have signed the *UN Convention on the Use of Electronic Communications in International Contracts*. Increasing participation in this convention to enhance legal certainty in international contracts is an important issue in building a global cross-border e-commerce system.

(III) A lower customs clearance cost effectively reduces entry barriers for cross-border e-commerce

Customs clearance costs, which consist of clearance fees and facilitation measures, are an important component of cross-border e-commerce transaction costs. Countries¹ and regions such as Singapore, the United States of America, and the European Union have relatively

1. Sample countries are listed in alphabetical order according to the first letter of their World Bank country code, and this applies throughout.

lower customs clearance costs related to cross-border e-commerce. This not only benefits domestic consumers but also facilitates the entry of foreign products into their markets through cross-border e-commerce channels.

(IV) Trade facilitation measures have significantly improved the efficiency of cross-border e-commerce development

The analysis shows that most sample countries have established legal and regulatory frameworks for the "single window"² system for international trade. Even before the WTO's *Trade Facilitation Agreement* was passed, various international organizations had already issued a series of guiding and advisory documents to provide countries with support and international standards in developing their "single window" systems, so as to meet the growing needs of global trade.

- **Column 2: Belgium Launches a Public Service Platform for Cross-Border E-Commerce**

To facilitate compliance and streamline operations for cross-border e-commerce businesses following the EU's VAT reform targeting e-commerce platforms, Belgium's Ministry of Finance, in collaboration with Customs and the Electronic World Trade Platform (eWTP), established a public service platform to offer compliance services to businesses.

The platform provides cross-border

merchants with a one-stop solution for customs clearance and tax declaration for EU cross-border transactions. It integrates digital identity authentication, smart tax benefits, and global digital compliance services, leveraging digital technology to support regulatory innovation and open new avenues for cross-border e-commerce cooperation.

(V) Digital infrastructure significantly drives the upgrading of cross-border e-commerce industries

A high-speed and stable network environment provides technical support for the efficient operation of cross-border e-commerce platforms, while infrastructure such as cloud computing, internet facilities, and data centers enables digital technologies to widely empower these platforms, advancing cross-border e-commerce toward digitalization, networking, and intelligence. For example, China's globally leading mobile payment ecosystem and extensive deployment of mobile internet technology have greatly enhanced user experience and transaction efficiency in cross-border e-commerce. Countries such as Singapore, Japan, and the United States of America have extensive submarine cable networks connecting multiple continents, offering more efficient data transmission channels for cross-border e-commerce. In Africa, countries like Kenya, Rwanda, and South Africa are actively engaged in international cooperation to develop

2. The "Single Window" for international trade refers to a unified platform provided by the government that enables participants in international trade to submit standardized information and documents, ensuring compliance with relevant laws, regulations, and management requirements.

fiber-optic broadband networks and cloud computing infrastructure, which are driving rapid growth in the digital economy and the expansion and upgrading of cross-border e-commerce.

● **Column 3: South Africa Actively
Engages in International Cooperation
for Digital Infrastructure Development**

In recent years, African countries such as South Africa, have seen rapid growth in e-commerce, establishing it as a new driver of economic growth. According to data from the U.S. International Trade Administration, online sales in South Africa rose by 66% from 2019 to 2020, reaching \$1.8 billion. South Africa has actively promoted international cooperation in digital infrastructure development, which has not only expanded the cross-border e-commerce sector but also promoted technology exchange and innovation, creating a model effect for other countries. South Africa joined the Belt and Road Initiative in 2015. The country has since collaborated with China and other African nations to establish a public cloud and has launched the first standalone 5G commercial network serving the entire African region, effectively accelerating the integration of African countries into the global digital economy and e-commerce market. According to Statista estimates, the number of e-commerce users in Africa is projected to increase from 139 million in 2017 to 520 million by 2025, with a compound annual growth rate of 17.9%. Cross-border e-commerce has become an important driver of China-Africa economic and trade cooperation. For instance, China's

Global Feixiang cross-border e-commerce platform, since entering Africa, has enabled over 10,000 businesses and individuals to start ventures on the platform, creating more than 5,000 jobs in South Africa.

**(VI) Modern logistics systems enable
cross-border e-commerce enterprises
to better integrate into global trade**

Diversified, centralized, and large-scale logistics facilities allow for cost-effective global market coverage, while automated, connected, and intelligent logistics models ensure efficient and transparent delivery of cross-border goods. By leveraging modern logistics systems, cross-border e-commerce companies can continuously optimize supply chain management and significantly lower entry barriers and costs for SMEs seeking access to international markets. For example, Germany, a well-established player in cross-border e-commerce, features highly automated mail sorting systems and an extensive postal network. In Japan, logistics companies actively adopt automation and intelligent management systems, utilizing robots for rapid sorting. Countries such as China, the Republic of Korea, Singapore, and the United States of America handle high port throughput and air cargo volumes. They provide flexible logistics solutions through automation technologies and multimodal transport systems that integrate various transportation methods, enhancing the profitability of cross-border e-commerce businesses in the global supply chain.

(VII) Universal digital literacy is a key factor driving the growth of cross-border e-commerce

Consumers with higher levels of digital literacy tend to have greater confidence in e-commerce and are more likely to engage in cross-border shopping. Globally minded consumers who actively explore online platforms are more open to trying products from various countries and regions, and their innovative demands drive the cross-border e-commerce industry toward diversification and customization. Consumers skilled in navigating online information and aware of cybersecurity contribute to a reliable and orderly cross-border e-commerce environment, as well as an attractive global trade market. For instance, countries such as China, Germany, the United Kingdom, and the Netherlands, which have highly developed cross-border e-commerce markets, have implemented strategic plans to enhance digital literacy for all age groups. These initiatives range from programming education for children, digital skills training for primary and secondary students, and digital skill development for adults and professionals, to digital education programs for the elderly. They also focus on providing equal opportunities for women in the digital field, promoting the widespread adoption of digital technology to benefit the entire population. As consumer behavior rapidly shifts online, cross-border e-commerce gains strong momentum for growth.

(VIII) Building enterprise capacity helps enhance the vitality of the cross-border e-commerce industry

Given the complex and dynamic nature of international market competition, strengthening capacities in areas such as supply chain management, international operations, and sustainable development can help businesses improve operational efficiency and strategic insights, enabling smoother expansion into overseas markets. Enhancing product innovation and brand development capabilities allows companies to better adapt to diverse consumer preferences and cultural differences, thereby boosting brand influence globally and achieving sustainable growth. For example, China has established cross-border e-commerce comprehensive pilot areas, offering businesses financial support, talent training, and knowledge sharing, which effectively enhance the competitiveness of production factors within cross-border e-commerce. Countries such as Germany, France, and the United Kingdom have launched digitalization programs for SMEs, supporting their transition to digital operations, supporting innovation-driven entrepreneurship, and facilitating rapid expansion in the cross-border e-commerce market.

● **Column 4: China's Cross-Border
E-commerce Comprehensive Pilot Areas**

China has strengthened cross-border e-commerce enterprise capacity by establishing cross-border e-commerce comprehensive (CEBC) pilot areas, facilitating the transformation of traditional commerce toward digital networks. This initiative facilitates the optimized allocation of production factors within the cross-border e-commerce sector, creating comprehensive industrial and ecological chains through innovations in corporate governance, management, service provision, and coordinated development.

According to data from the Ministry of Commerce, China has established 165 cross-border e-commerce comprehensive pilot areas since 2015. Currently, enterprises within these areas account for over 95% of the nation's cross-border e-commerce trade. China encourages these areas to actively explore innovations in regulation, standards, and digitalization. First, supportive policies have been continuously refined, with nearly 200 policy measures introduced and nearly 70 demonstrated practices established. Second, brand development is a focus, with the CBEC pilot areas actively fostering leading enterprises to guide the digital transformation of upstream and downstream SMEs. Third, China actively engages in international cooperation, supporting CBEC pilot areas, industries, and enterprises in international exchanges and collaborations. Over the past five years, China's cross-border e-commerce trade volume has increased more than tenfold. The country now boasts over

120,000 cross-border e-commerce entities, more than 1,000 cross-border e-commerce industrial parks, and over 2,500 overseas warehouses. This development has become a significant driver of foreign trade growth.

The competitiveness of a country in cross-border e-commerce depends not only on a robust regulatory framework and supportive public services but also on comparative advantages in areas such as industrial foundation, trade markets, and production factors. Analyzing the development practices of various countries in cross-border e-commerce promotes countries to learn from one another, build on each other's strengths, and foster a business environment that supports the growth of cross-border e-commerce.



02 Research Framework

(I) Definition of Cross-Border E-Commerce Competitiveness

In this study, "cross-border e-commerce" refers to activities involving the cross-border sale or

purchase of goods or services via computer networks, encompassing both imports and exports. Both import and export³ flows are integral to cross-border e-commerce and jointly contribute to the robust growth of global trade.⁴

The competitiveness level of a country in specific industries reflects in both its "hard power", such as industry scale, technological level, and ecosystem vitality, and in its "soft power", including the legal regulations, policy planning, public services, and involvement in international rules dedicated to fostering the industry.⁵ Therefore, this study deconstructs "cross-border e-commerce competitiveness" through two

3. This definition aligns with the concept of "international e-commerce" as defined in the *Handbook on Measuring Digital Trade* jointly released in 2023 by the International Monetary Fund (IMF), the Organisation for Economic Co-operation and Development (OECD), the United Nations Conference on Trade and Development (UNCTAD), and the World Trade Organization (WTO). According to this definition, "international e-commerce" is distinguished from "domestic e-commerce" as "the international sale or purchase of a good or service, conducted over computer networks by methods specifically designed for the purpose of receiving or placing orders". This corresponds to the portion of "digital trade" that can be categorized as "digitally ordered trade".

4. In terms of imports, cross-border e-commerce connects consumers and producers worldwide, greatly enriching market offerings and meeting the growing demand for diversified consumer options. It also effectively reduces the cost of imported goods, allowing consumers to access high-quality products at more affordable prices. For exports, cross-border e-commerce provides small and medium-sized enterprises (SMEs) with a cost-effective and efficient export channel, lowering the barriers to export. SMEs can directly engage with overseas consumers, gain insights into global market demands and preferences, and adjust their market positioning and marketing strategies in a timely manner, so as to enhance their competitiveness.

5. This approach aligns with the World Economic Forum's definition of "competitiveness" in the *Global Competitiveness Report* (2016), which describes competitiveness as the set of institutions, policies, and factors determining a country's productivity.

dimensions: **business environment** and **industry competitiveness**.

Business environment for cross-border e-commerce represents the external conditions in which these enterprises operate, covering aspects such as involvement in domestic policies and laws and international rules, customs clearance costs, and public services. A favorable business environment provides companies with a clear, transparent, and predictable regulatory landscape, reducing unnecessary administrative barriers and institutional transaction costs while fostering innovation and market competitiveness. The smooth operation of cross-border transactions, payments, logistics, and customs processes heavily relies on an optimized business environment. For instance, policies like low tariffs, streamlined customs procedures, and well-developed electronic transaction systems can significantly improve the operational efficiency and market responsiveness of cross-border e-commerce companies.

Industry competitiveness in cross-border e-commerce encompasses the factors that determine the production efficiency and market expansion capacity of this sector, directly reflecting each country's strength and potential in this field. Countries with strong competitiveness in cross-border e-commerce typically possess well-established industry support systems, extensively interconnected international trade networks, and numerous enterprises with global competitiveness. As industry competitiveness strengthens, importing countries benefit from a wider range of consumer choices, encouraging local industries to accelerate innovation and upgrades. At the same time, enterprises in exporting countries can overcome geographical constraints, gaining access to larger markets and more exchange opportunities.

(II) Country Selection and Analysis

To ensure that the research results accurately reflect the global landscape of cross-border e-commerce development, this report reviews the status of cross-border e-commerce across countries worldwide. After considering factors such as industry scale, characteristics, representativeness, geographic location, and level of economic development, 55 sample countries were selected as subjects for the study on cross-border e-commerce competitiveness at the country level. These include 12 economies in Asia, 31 in Europe, 3 in Africa, 3 in North America, 4 in South America, and 2 in Oceania. The full list is provided in Appendix 1.

(III) Indicator System and Framework

This report establishes an indicator system to measure cross-border e-commerce competitiveness at the country level from two dimensions: business environment and industry competitiveness (see Figure 1).

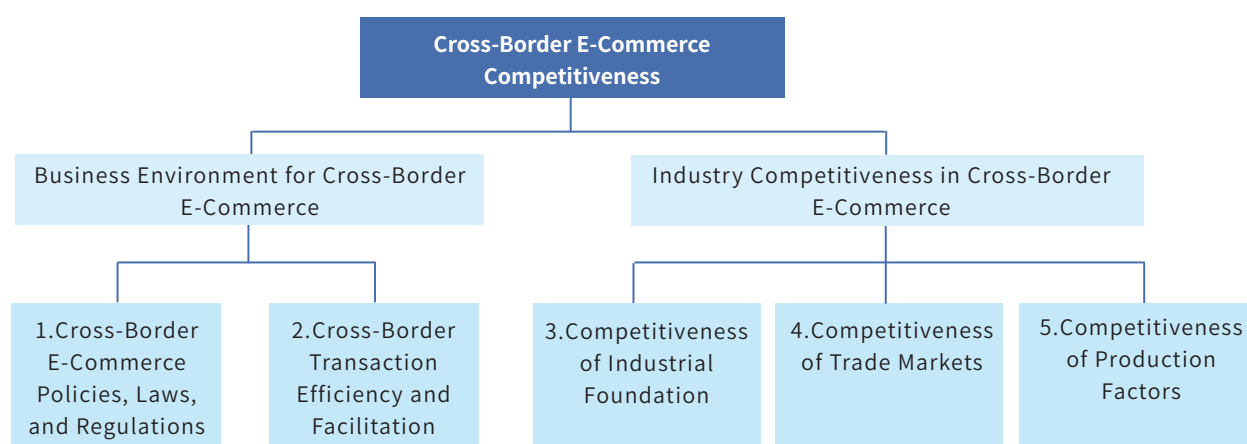


Figure 1: Indicator System for Cross-Border E-Commerce Competitiveness

1. Indicator System for the Business Environment for Cross-Border E-Commerce

A comprehensive legal and regulatory framework is essential for the development of cross-border e-commerce. A well-developed regulatory environment enhances policy transparency and predictability, standardizes the behavior of cross-border e-commerce operators, and provides legal and policy support for the healthy growth of the industry. Reducing costs and increasing efficiency are key to cross-border e-commerce, as improved transaction efficiency and facilitation can lower operational costs for businesses. Drawing on the World Bank's business environment research framework, the key indicators for the cross-border e-commerce business environment focus on two main areas: legal and regulatory framework and transaction efficiency. In terms of the legal and regulatory framework, cross-border e-commerce development is closely linked to both domestic laws and policies and involvement in international rules. For transaction efficiency and facilitation, key considerations include not only the market entry costs of cross-border

e-commerce products and customs clearance efficiency but also the accessibility of government public services.

The business environment indicator system is analyzed through two primary indicators: "cross-border e-commerce policies, laws, and regulations" and "transaction efficiency and facilitation". Each primary indicator includes two secondary indicators that cover transaction processes such as trading, payment, customs clearance, taxation, and foreign exchange settlement. These secondary indicators are further divided into 22 tertiary indicators. Definitions for the primary and secondary indicators are as follows. (Detailed descriptions of indicators and calculation methods can be found in Appendix 1 and Appendix 2.)

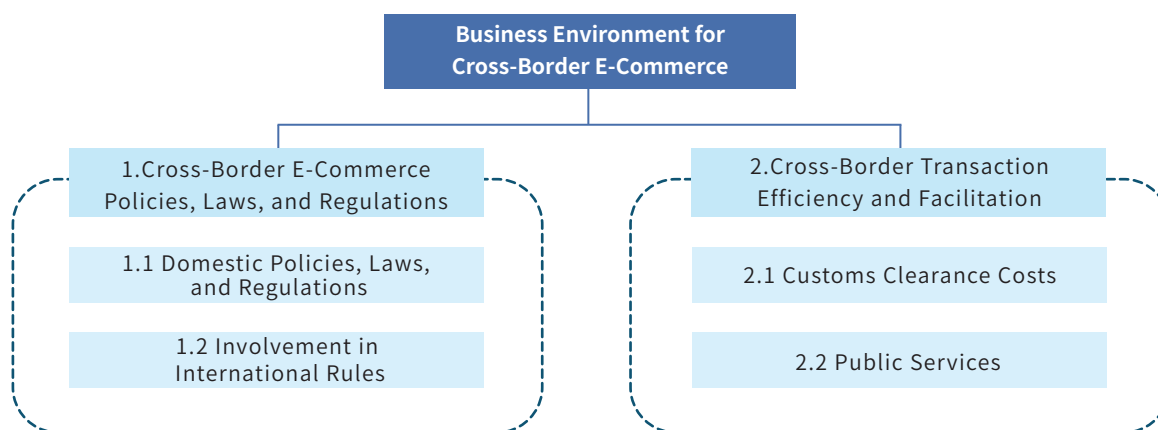


Figure 2: Research Indicators for the Business Environment for Cross-Border E-Commerce

(1) Cross-border e-commerce policies, laws, and regulations refer to unilateral, bilateral, or multilateral institutional norms directly related to cross-border e-commerce transactions. A comprehensive legal and regulatory framework of policies, laws, and regulations is essential for the development of cross-border e-commerce. A well-developed regulatory environment enhances transparency and predictability, standardizes business practices in cross-border e-commerce, and provides legal and policy support for the industry's healthy growth. This legal and regulatory framework includes both domestic policies, laws, and regulations as well as involvement in international rules.

Domestic policies, laws, and regulations refer to Institutional norms established and implemented domestically to support the development of cross-border e-commerce, including relevant policies and legal and regulatory frameworks.

Involvement in international rules refer to binding international agreements that countries join to promote cross-border e-commerce and international trade. Such involvement can reduce transaction costs and lower trade barriers.

(2) Transaction efficiency and facilitation refer to the costs incurred and the public services available from government agencies during cross-border e-commerce transactions. Improving transaction efficiency and facilitation can reduce operational costs for businesses and enable faster responses to market demand.

Customs clearance costs include both customs fees and customs facilitation. Customs fees refer to the tariffs and indirect taxes (such as VAT, sales tax, or goods and services tax) required for a product to enter the host country's market. Customs facilitation involves the streamlined processes and facilitation measures available for products entering the host country's market.

Public services refer to foundational and universally accessible services provided by government agencies to meet the needs of cross-border e-commerce transactions. Comprehensive and convenient public services can significantly improve the efficiency of cross-border e-commerce.

2. Indicator System for Industry Competitiveness in Cross-Border E-Commerce

Cross-border e-commerce is characterized by a high degree of internationalization, digitalization, active participation of SMEs, and intense competition. Research on industry competitiveness in cross-border e-commerce should reflect the comprehensive support that digital and traditional industries provide to e-commerce enterprises expanding internationally, the stimulating effect of import-export trade on domestic industries, and companies' willingness and capacity to participate in international competition. Drawing on international trade theories and industry competitiveness models, such as Porter's Diamond Model, the main factors that determine industry competitiveness in cross-border

e-commerce include related and supporting industries, domestic and international demand markets, and the industry's production capacity. Developing competitive advantages in cross-border e-commerce requires support from a competitive digital sector and well-developed infrastructure including logistics and shipping networks. Additionally, the scale of global market demand—especially for high-quality and innovative products through online shopping—stimulates the industry to continuously enhance product and service standards. The industry also demands sufficient production capital, abundant data factor, and internationally competent professionals to improve productivity and innovation, thereby strengthening its international competitiveness.

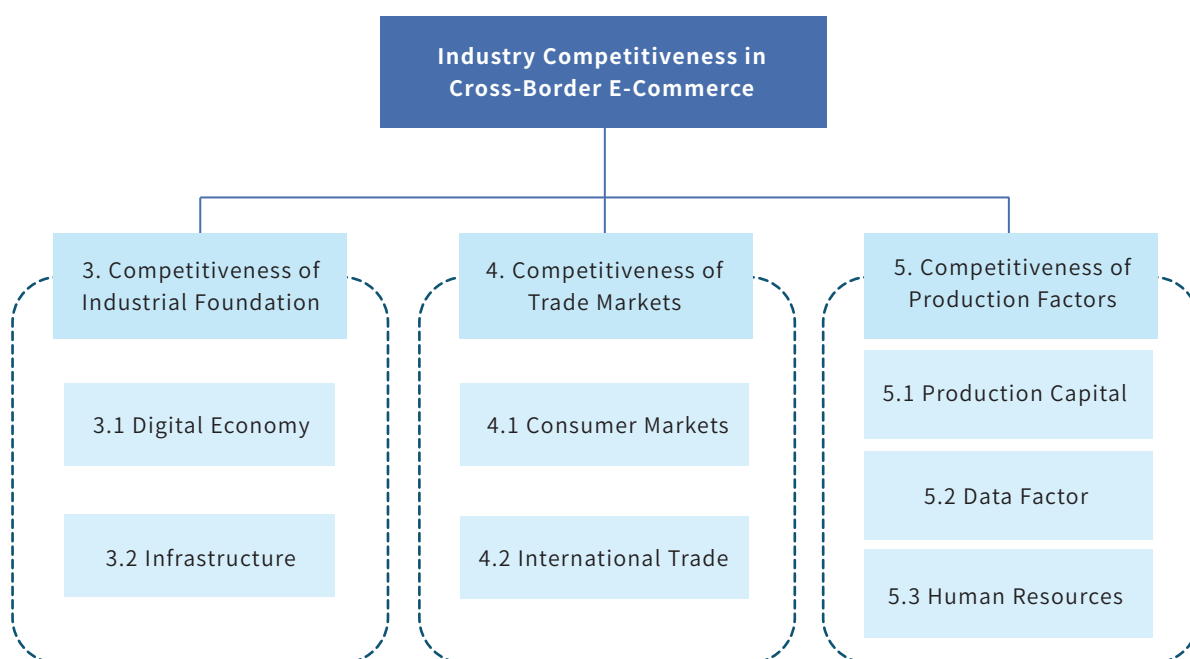


Figure 3: Indicator Design for Cross-Border E-Commerce Industry Competitiveness Research

(3) Competitiveness of the industrial foundation in cross-border e-commerce

refers to the competitiveness of related and supporting industries, as well as infrastructure. Cross-border e-commerce operators need to leverage internet technology and physical infrastructure to bridge the gap between producers and consumers and gain a competitive edge. Industrial foundation primarily includes digital industries, digitalized traditional industries, and supporting infrastructure such as telecommunications, logistics, and transportation. Such competitiveness is reflected in metrics such as scale and development level.

Digital economy: Industries such as internet services, software services, and electronic information manufacturing provide platform services, payment channels, and artificial intelligence solutions to support secure and efficient operations for all participants in cross-border e-commerce. Digital technologies and applications empower the digital transformation of traditional industries, driving comprehensive improvements in supply chain optimization, market expansion, and customer experience within the cross-border e-commerce sector.

Infrastructure: The development of infrastructure such as logistics and telecommunications must be compatible with cross-border e-commerce to establish an efficient, stable, and secure operating environment, providing external support for the sustainable and healthy growth of the cross-border e-commerce industry.

(4) Competitiveness of trade markets in cross-border e-commerce encompasses the competitiveness of domestic and international markets. The stronger the online purchasing power of a country's residents, the larger

the cross-border transaction volume and the greater its share of economic activities, the more competitive its cross-border e-commerce trade markets are.

Consumer markets: Consumer purchasing power, consumption attitudes, and habits directly affect the capacity and demand potential of the cross-border e-commerce market. By meeting diverse market demands, adopting differentiation strategies, and continuously enhancing product quality and service standards, the cross-border e-commerce industry can sustain and strengthen its competitiveness.

International trade: The scale and share of cross-border transactions reflect the performance and influence of the cross-border e-commerce industry in international markets. Global consumer demand for cross-border e-commerce products attracts new enterprises to the market and drives the industry to continuously optimize products and services to better adapt to the international market environment and improve industry competitiveness.

(5) Competitiveness of production factors in cross-border e-commerce refers to the inherent competitiveness of production factors such as technology, labor, and capital that cross-border e-commerce operators invest in to supply goods or services across borders. This indicator reflects the scale, technological sophistication, and productivity of these resources.

Production capital: The scale of financial and physical assets of cross-border e-commerce companies determines the upper limits of the industry's overall capacity and sales potential. Operators with more substantial resources are better positioned to expand their scale, explore new markets, and strengthen competitiveness.

Data factor: Data supports market positioning and customer outreach in the cross-border e-commerce industry. As digitalization continues to advance, companies' operational efficiency and market responsiveness are greatly enhanced, rapidly boosting their market competitiveness.

Human resources: Skilled e-commerce professionals are crucial to the competitiveness of the cross-border e-commerce industry. Cultivating e-commerce talent with both theoretical knowledge and practical skills requires early investment in training and development. This lays a strong foundation for the industry's sustainable growth.





03 Results Analysis

(I) Analysis Results by Indicator Dimension

1. Analysis on Business Environment Indicators for Cross-Border E-Commerce

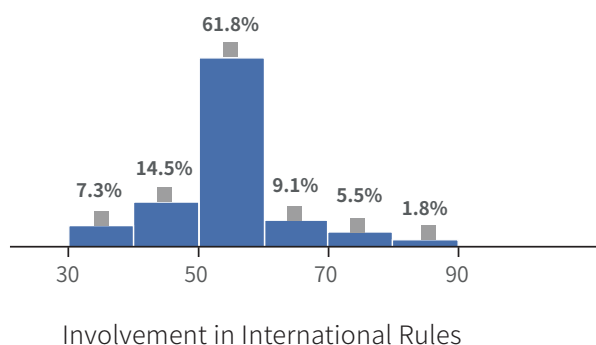
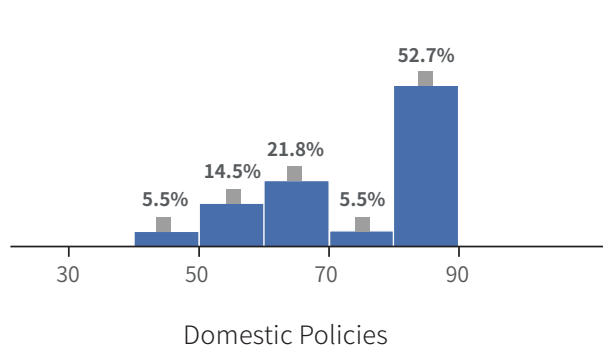


Figure 4: Frequency Histogram of Secondary Indicators under Policies and Laws

1.1 Cross-border e-commerce policies, laws, and regulations: Compared to developing countries, developed countries have more comprehensive domestic policies and legal and regulatory frameworks and a higher level of engagement in international rule-making, providing a solid foundation for a favorable business environment in cross-border e-commerce. Figure 4 shows the distribution of scores for the two secondary indicators, "domestic policies, laws, and regulations" and "involvement in international rules", across countries. The results indicate that, for domestic policies (left chart), 52.7% of the sample countries scored above 80 points on this indicator⁶. In terms of involvement in international rules(right chart), fewer than 20% of the countries scored above 60.

6.Detailed descriptions of indicators and calculation methods can be found in Appendix 2.

Regarding the indicator for domestic policies and legal and regulatory frameworks, countries like China and Singapore stand out, with a focus on policies and legal and regulatory frameworks in cross-border e-commerce. For instance, China's *14th Five-Year Plan for E-Commerce Development* has established a clear strategic framework for e-commerce development. Countries in regions such as Latin America, Southeast Asia, and Africa, which began later in this area, still have significant growth potential in enhancing the completeness and openness of cross-border e-commerce policies, laws, and regulations.

In terms of involvement in international rules, Singapore excels in international e-commerce rule-making and has actively promoted international agreements such as the *Digital Economy Partnership Agreement* (DEPA), along with establishing multiple digital economy agreements related to cross-border e-commerce with countries like the United Kingdom. Countries such as China, Colombia, and the United Kingdom have actively incorporated or adopted e-commerce-related laws and regulations within their domestic laws, including the United Nations Commission on International

Trade Law (UNCITRAL) *Model Law on Electronic Commerce*. Some developing countries in regions like Asia, Africa, Latin America, and the Middle East show relatively low levels of participation in trade agreements and data flow agreements, suggesting substantial potential for further involvement in international rules related to cross-border e-commerce.

1.2 Cross-border transaction efficiency and facilitation: Significant differences exist among countries in terms of cross-border transaction efficiency and facilitation. Developed countries typically exhibit high customs clearance efficiency and lower clearance costs, while emerging economies, such as China, also perform well in this area. Figure 5 shows the distribution of countries' scores in the two secondary indicators of customs clearance costs and public services. The results indicate that over 70% of countries scored below 60 in customs clearance costs, indicating considerable room for improvement compared to the most competitive countries (left chart). In terms of public services, most countries offer services that support the development of cross-border e-commerce, with 83.6% scoring above 90 (right chart).

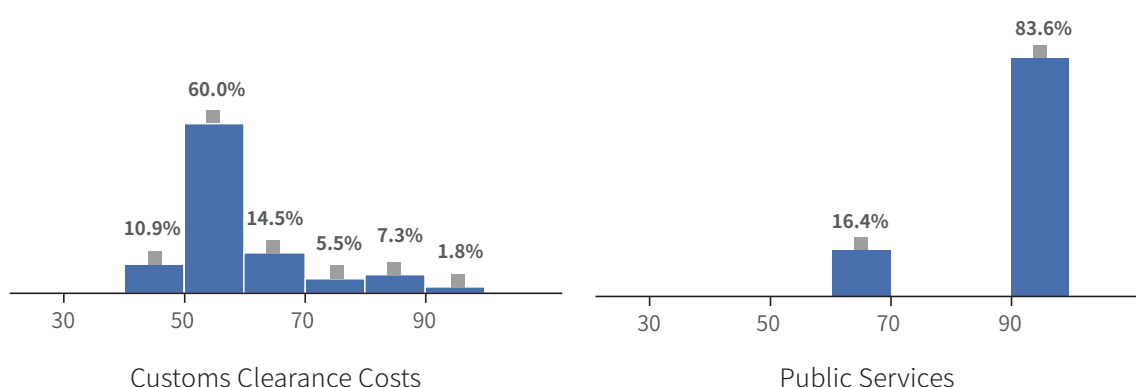


Figure 5: Frequency Histogram of Secondary Indicators under Efficiency and Facilitation

For customs clearance cost, countries in Asia, Africa, and South America generally have higher tariffs and indirect tax rates, and fewer Authorized Economic Operator (AEO)⁷ mutual recognition agreements.

In terms of public services, most sample countries have established the "single window" system for international trade, creating favorable conditions for customs facilitation in cross-border e-commerce. For instance, the Canada Border Services Agency's (CBSA) Single Window Initiative enables data sharing between the Canadian government and importers. Additionally, 48 of the sample countries have implemented digital capability enhancement plans for cross-border e-commerce, with policy priorities including streamlined customs procedures and specialized training for cross-border e-commerce.

2. Analysis on Industry Competitiveness Indicators in Cross-Border E-Commerce

2.1 Competitiveness of industrial foundation in cross-border e-commerce: Countries with a larger scale and a stronger industrial foundation demonstrate more prominent competitiveness. Countries such as China, Germany, Japan, and the United States of America benefit from well-developed infrastructure networks, substantial government support, and mature payment ecosystems and logistics systems, all of which provide solid backing for the development of cross-border e-commerce industries. Figure 6

illustrates the distribution of development level across nations with regard to the two secondary indicators, digital economy and infrastructure. The results reveal a "low at both ends, high in the middle" distribution pattern, with the highest concentration of countries scoring between 60 and 70 points, accounting for 30.9% and 34.5% of the sample. Additionally, 1.8% and 3.6% of the sample countries score below 40 points on the indicators, limiting their potential for cross-border e-commerce development.



7. AEO stands for Authorized Economic Operator. The AEO system is a core component of the *Framework of Standards to Secure and Facilitate Global Trade* established by the World Customs Organization (WCO). It aims to minimize customs supervision risks through collaboration among customs authorities, businesses, and other government agencies, thereby enhancing global supply chain security and facilitating trade. The system creates mutual benefits for customs and businesses, ensuring smoother trade flows. Under this system, customs authorities certify companies based on their credit status, compliance level, and security standards. Certified companies are then eligible for preferential treatment from customs.

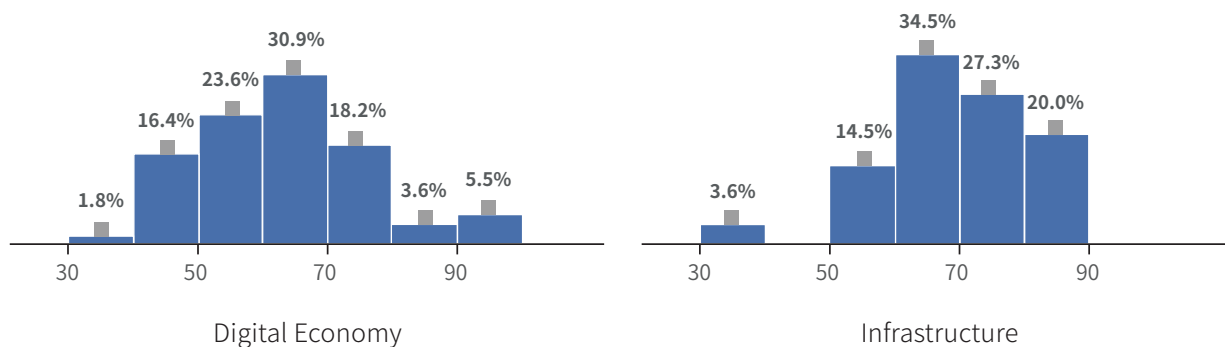


Figure 6: Frequency Histogram of Secondary Indicators under Competitiveness of Industrial Foundation

In terms of the digital economy, certain sample countries have a clear advantage. This can partly be attributed to the economies of scale in digital technology, where expanding user bases leads to reduced unit costs and exponential growth in benefits. Leveraging technologies such as cloud computing, data centers, and artificial intelligence, these economies rapidly strengthen their competitive edge in cross-border e-commerce. For example, China is advancing the construction of the Digital Silk Road under the Belt and Road Initiative with partner countries, facilitating active cooperation in the form of Silk Road e-commerce to achieve mutual benefits and win-win outcomes. Partnerships between China and countries like Rwanda and Chile have facilitated the entry of popular imported products, such as Rwandan coffee and Chilean cherries, into the Chinese market.

Regarding infrastructure, the development level is relatively evenly distributed across the sample countries. While many countries possess high-quality infrastructure, some middle-and low-income sample countries still need to accelerate improvements. Economically developed countries have higher levels of logistics network

automation, which enhances competitiveness of their industrial foundation.

2.2 Competitiveness of trade markets in cross-border e-commerce: Countries with advantages typically feature high-income consumer groups and accessible geographic locations and European countries generally perform well on this indicator. Figure 7 illustrates the distribution of development levels across sample countries in the two secondary indicators: "consumer markets" and "international trade". The results show that, for the consumer markets indicator, mid-range countries are relatively evenly distributed, with over 70% scoring between 50 and 80 points (left chart). For the international trade indicator, scores are more concentrated, with more than 45% of countries scoring between 60 and 70 points (right chart).

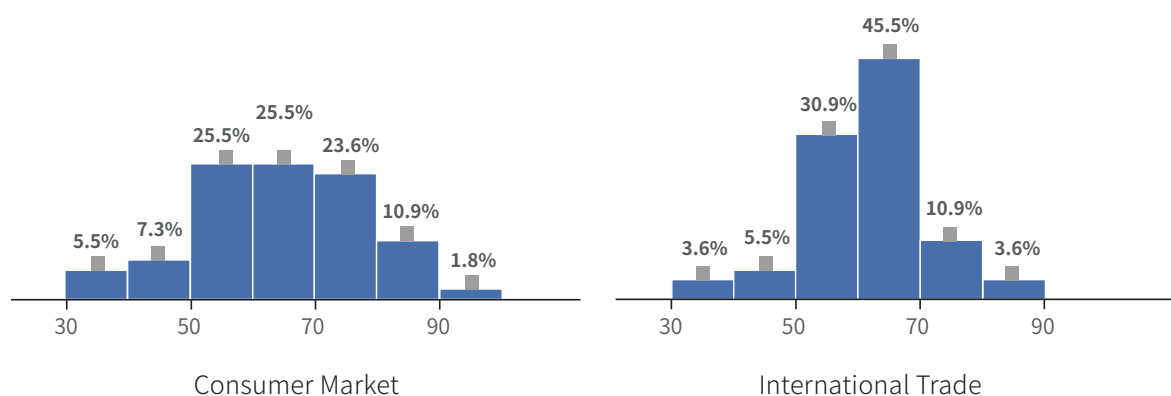


Figure 7: Frequency Histogram of Secondary Indicators under Competitiveness of Trade Markets

For the consumer markets indicator, different countries exhibit distinct consumer characteristics and varied cross-border e-commerce development models. Large economies, such as China and the United States of America, possess vast consumer bases that offer extensive market opportunities for cross-border e-commerce companies. EU countries, such as Germany, Denmark, and the Netherlands have some of the highest online shopping participation rates globally, having established a mature e-commerce market. In the Asia-Pacific region, consumers in countries such as Australia, Japan, and the Republic of Korea have high expectations for shopping experiences and product quality, which continuously push businesses to enhance their competitiveness. Among middle-income countries, those with a large middle-class and young population, such as Brazil and Turkey, witness strong consumer demand that fuels the growth of their e-commerce markets.

● Column 5 : Brazil Develops Diversified Shopping Models

Brazil's cross-border e-commerce industry is experiencing rapid growth, with consumers increasingly accustomed to online and cross-border shopping, enjoying convenient services and a diverse range of products. According to Statista, in 2023, 72% of Brazilian online shoppers engaged in cross-border shopping, showing high demand for foreign products, especially in the electronics and fashion categories. Specifically, 50% of Brazilian cross-border shoppers purchased consumer electronics from foreign websites, while 21.4% bought fashion and accessory items. Brazilian consumers have access to various online payment methods, including credit cards and e-wallets. Additionally, the PIX instant payment system, launched in 2020, has become highly popular, significantly enhancing the efficiency and security of cross-border e-commerce, while tapping into large potential consumer markets.

In terms of the international trade, many countries display similar growth trends. Active e-commerce consumers drive collaborative growth in cross-border e-commerce under the influence of supportive policies and market forces. EU countries such as Belgium, the Netherlands, and Slovenia demonstrate comparable advantages, supported by a series of EU policy frameworks and action plans aimed at enhancing digital literacy and skills among member states. These digitally proficient consumers leverage internet information and digital technologies to seek high-quality products on global e-commerce platforms. Additionally, numerous countries are actively promoting international cooperation, leading to significant growth in cross-border e-commerce trade. For instance, Thailand, in collaboration with Alibaba Group, has introduced cross-border e-commerce solutions tailored for SMEs and they have jointly developed a Digital Free Trade Zone, significantly lowering the barriers for Thai businesses to access global markets. China has also established bilateral e-commerce cooperation mechanisms with 31 countries. With the Silk Road e-commerce international cooperation initiative continuing

to deepen, countries work together to promote innovation and development in cross-border e-commerce.

2.3 Competitiveness of production factors in cross-border e-commerce:

Larger economies tend to exhibit stronger competitiveness, driven by well-established industry chains and abundant resources that support the prosperous development of cross-border e-commerce industries. Asian countries such as China, India, Japan, and the Republic of Korea show advantages in the indicators, propelled by their efforts in financial support, digital transformation, and talent cultivation. Figure 8 illustrates the distribution of sample country scores across the three secondary indicators: production capital, data factor, and human resources. The results show that scores for production capital and human resources are concentrated in the lower to middle range, with fewer than 10% of the countries scoring above 80, but over 50% scoring below 60 (left and right charts). In contrast, the data factor indicator more closely resembles a normal distribution, with over 75% of countries scoring between 50 and 80.

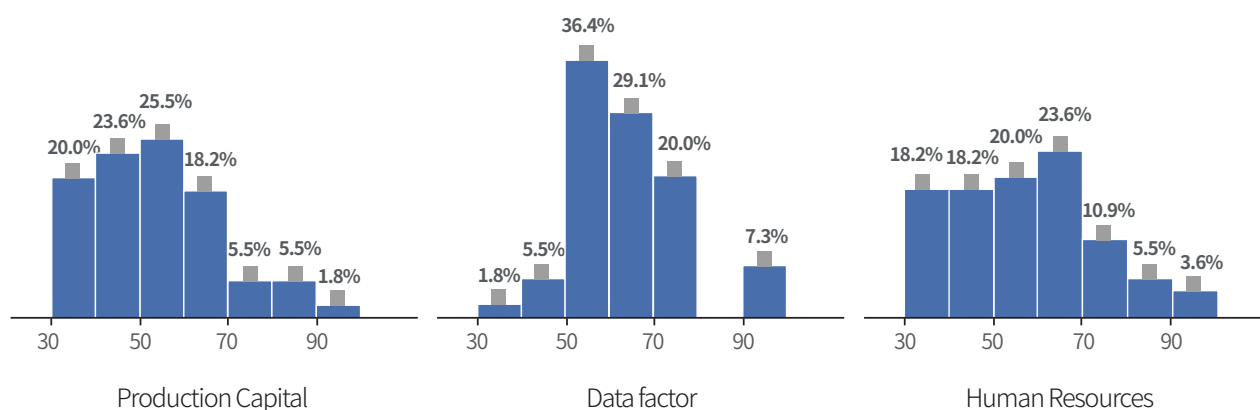


Figure 8: Frequency Histogram of Secondary Indicators under Competitiveness of Production Factors

For the production capital, many countries are clustered at medium to lower levels of development, with leading nations showing clear advantages. Large economies such as China, India, and the United States of America stand out, indicating that cross-border e-commerce growth is built on broader macroeconomic foundations and benefits from economies of scale, where rising GDP complements the expansion of cross-border e-commerce. In Germany, France, the United Kingdom, and Japan, SMEs are highly engaged in cross-border e-commerce, reflecting a competitive edge. These countries support SMEs through policies and funding to ease their entry into the cross-border market. For example, France has established an online professional consultation platform to enhance SME export capabilities. These SMEs are offered financial support and tax incentives for their digital transformation.

Regarding the data factor, sample countries are more clustered around the average development level. The development of the data factor in cross-border e-commerce shows greater mutual influence among countries, demonstrating the strong mobility of data as a new production factor.

In terms of human resources, many sample countries are concentrated at medium to lower development levels, with leading countries showing clear advantages. This distribution pattern is similar to that of the production capital indicator. Countries such as China, Germany, the United Kingdom, and the United States of America place high importance on talent cultivation. These countries often implement comprehensive and multi-tiered vocational

education systems. As they continuously innovate and optimize talent development models in line with contemporary trends, these countries inject sustained momentum into the growth of the cross-border e-commerce industry.



3. Overall Results Analysis

Overall, the 55 sample countries demonstrate varied strengths across the five primary indicators, with cross-border e-commerce competitiveness showing some correlations among dimensions but reflecting diverse development models shaped by factors such as geographic region and income level. This study uses a color gradient to display each country's level of competitiveness in cross-border e-commerce across each dimension, sorted alphabetically by World Bank country code. As shown in Figure 9, **the color gradient, from light to dark, represents the progression of countries from the initial to developing, good, or mature stages in each indicator.**

Country	Business Environment		Industry Competitiveness		
	1 Policies and Laws	2 Efficiency and Facilitation	3 Industrial Foundation	4 Trade Markets	5 Production Factors
Argentina					
Australia					
Austria					
Belgium					
Bulgaria					
Brazil					
Canada					
Switzerland					
Chile					
China					
Colombia					
Cyprus					
Czech Republic					
Germany					
Denmark					
Spain					
Estonia					
Finland					
France					
United Kingdom					
Greece					
Croatia					
Hungary					
Indonesia					
India					
Ireland					
Israel					
Italy					

Country	Business Environment		Industry Competitiveness		
	1 Policies and Laws	2 Efficiency and Facilitation	3 Industrial Foundation	4 Trade Markets	5 Production Factors
Japan					
Kenya					
Cambodia					
Republic of Korea					
Lithuania					
Luxembourg					
Latvia					
Mexico					
Malaysia					
Netherlands					
Norway					
New Zealand					
Philippines					
Poland					
Portugal					
Romania					
Russia Federation					
Rwanda					
Singapore					
Slovakia					
Slovenia					
Sweden					
Thailand					
Turkey					
United States of America					
Uzbekistan					
South Africa					



Figure 9: Country Distribution of Cross-Border E-Commerce Competitiveness

Based on the calculation results for each indicator, the overall distribution of cross-border e-commerce competitiveness is shown in Figure 10 (countries within each quadrant sorted alphabetically by World Bank country code). Countries in the first quadrant exhibit a favorable business environment and strong industry competitiveness, placing their cross-border e-commerce development in a relatively mature stage, with mutual enhancement between business environment and industry

competitiveness. Countries in the fourth quadrant have a well-developed business environment but still need to improve their industry competitiveness. Countries in the second quadrant possess high industry competitiveness; however, their business environment somewhat limits the growth of cross-border e-commerce. Countries in the third quadrant have untapped potential in both business environment and industry competitiveness, with cross-border e-commerce development in its initial stages.

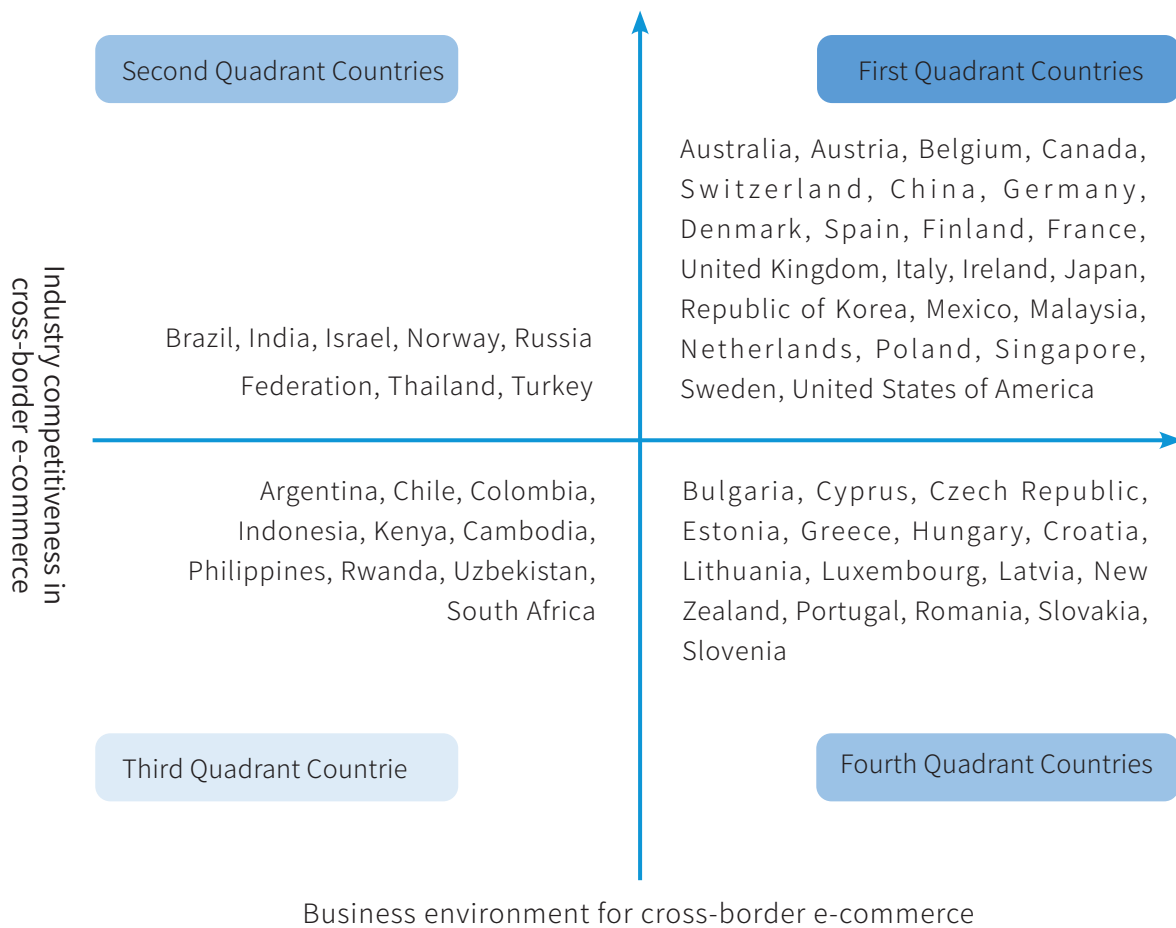


Figure 10: Quadrant Chart of Business Environment and Industry Competitiveness in Cross-Border E-Commerce

(II) Analyse Results by Representative Countries

This report selects a few sample countries that perform well in certain aspects of business environment and industry competitiveness. These countries (sorted in alphabetical order by World Bank country code) have successful experiences and practices in building legal and regulatory frameworks, developing e-commerce strategies, engaging in international rules, and advancing industry development, which can serve as references for the global growth of cross-border e-commerce.

(1) Canada (CAN): Canada has relatively low customs clearance costs and has signed numerous mutual recognition agreements under the AEO program, reducing the barriers and costs for cross-border e-commerce to enter its domestic market. Canada demonstrates balanced development in the industrial foundation, trade markets, and production factors of the cross-border e-commerce industry. Additionally, its efficient and extensive postal and logistics networks support a competitive advantage for cross-border e-commerce.

(2) China (CHN): China excels in policies, laws, and regulations related to cross-border e-commerce, involvement in international rules, and cross-border transaction facilitation. China's commitment to e-commerce within the *Regional Comprehensive Economic Partnership* (RCEP) agreement includes explicit openness, and it has established specialized customs procedures for "B2B direct exports" and "exports to overseas warehouses", greatly enhancing export efficiency for Chinese cross-border e-commerce businesses. Additionally, China's "bonded cross-border

e-commerce" customs regulation for imports effectively reduces domestic procurement and logistics costs, significantly promoting exports of agricultural and cosmetic products from Southeast Asia and Europe to China. Moreover, China's strong comprehensive development in the industrial foundation, trade markets, and production factors benefits from its rapidly growing digital economy, vast consumer base, and innovation in fields such as big data and artificial intelligence. To further expand its openness, China has applied to join the *Comprehensive and Progressive Agreement for Trans-Pacific Partnership* (CPTPP) and the *Digital Economy Partnership Agreement* (DEPA).

(3) Germany (DEU): Germany has jointly launched unified and comprehensive policies, laws, and regulations with other EU countries, which optimized the business environment for cross-border e-commerce. Additionally, Germany possesses mature telecommunications, postal, and logistics infrastructures, a large consumer market, and a high-quality vocational education system supported by ongoing skills training. These factors contribute to Germany's competitive advantages in the consumer markets and production factors.

(4) France (FRA): France has also established unified and comprehensive policies, laws, and regulations in collaboration with other EU countries, actively engaging in international rules that further enhance the business environment closely related to cross-border e-commerce. Additionally, France benefits from a high-quality education system and a rich talent pool. These production factors contribute significantly to its strong competitiveness in the cross-border e-commerce sector.

(5) United Kingdom (GBR): The UK has a relatively comprehensive legal and regulatory framework related to cross-border e-commerce and actively engages in integrating with international trade and economic rules. Following Brexit, the UK swiftly enacted several laws, including the *Single Trade Window (Establishment, Operation, and Information) Regulations 2024*, and joined high-standard international trade agreements such as the CPTPP. The rapid development of the digital economy in the UK has fostered a high acceptance of cross-border e-commerce among domestic consumers. The UK's capabilities in data factor and human capital have played a positive role in enhancing the competitiveness of its cross-border e-commerce industry.

(6) Japan (JPN): Japan's low customs clearance costs are a key highlight in optimizing its business environment. The country benefits from relatively low tariff and VAT rates, as well as a significant number of mutual recognition agreements under the AEO program. Moreover, Japan exhibits strong competitiveness in cross-border e-commerce infrastructure and digital economy development, supported by its efficient transportation network, advanced logistics systems, and significant progress in information and communication technology and digital innovation.

(7) Kenya (KEN): Kenya has made impressive strides in the development of policies, laws, and regulations related to cross-border e-commerce. At the country level, Kenya has established a clear e-commerce development strategy, outlining the direction and goals for the country's e-commerce growth. In terms of legislation, Kenya has performed well in cross-border logistics-related laws. Additionally, Kenya actively participates in WTO negotiations on e-commerce, aiming to

create a favorable international environment for the development of its domestic e-commerce sector.

● **Column 6 : Electronic Payments Thrive in Kenya**

In 2023, Kenya identified reducing barriers to electronic payments as a key strategic goal in its national e-commerce development strategy. Supported by this strategy, electronic payments have flourished in Kenya, with the country's financial services penetration rate increasing from 27% in 2006 to 80% in 2023. The M-PESA mobile payment platform, established in collaboration with the UK, has become a leader in Africa's electronic payments sector. As of March 2024, M-PESA held a 94.9% market share in Kenya, with over 38.7 million users, accounting for 75% of Kenya's total population.

(8) Republic of Korea (KOR): The Republic of Korea excels in its involvement in international rules. It actively participates in laws related to cross-border e-commerce, such as the *UNCITRAL Model Law on Electronic Commerce*. This engagement serves as a vital driver for optimizing the business environment for cross-border e-commerce. Furthermore, the Republic of Korea shows high development levels in data factor, reflecting its innovative advantages driven by data.

(9) Singapore (SGP): Singapore is a leader in international rules involvement and reducing customs clearance costs, standing out as a globally recognized free trade port with substantial advantages in customs liberalization

and facilitation. Singapore actively promotes cross-border data flows and has led the signing of influential digital trade agreements, such as the Digital Economy Partnership Agreement (DEPA), in recent years. Its strengths in data flow facilitation have attracted many cross-border e-commerce platforms to establish regional headquarters in Singapore. Furthermore, Singapore's strategic geographic location, efficient logistics system, advanced port infrastructure, and robust financial system bolster its strong performance across international trade, infrastructure, and production capital indicators.

- **Column 7: Singapore Actively Engages in Digital Economy Agreements**

Singapore has an open regulatory environment and is an active proponent and pioneer of "The ASEAN Way", advocating for inclusive and open cooperation. This openness has led to the development of international digital economy agreements, such as the *Digital Economy Partnership Agreement* (DEPA) and the *UK-Singapore Digital Economy Agreement* (UKSDEA). The DEPA emphasizes key areas such as e-commerce facilitation, data transfer liberalization, and personal information security. In the UKSDEA, e-commerce facilitation, free flow of data, and data protection remain central. The agreement also mandates efforts by both countries to promote electronic payment systems and consumer protection to ensure the security of cross-border transactions.

(10) United States of America (USA): The favorable business environment in the United States of America is supported by a comprehensive system of policies, laws, and regulations, as well as relatively low customs clearance costs. At the same time, the U.S. demonstrates overall advantages in cross-border e-commerce industry competitiveness, which stem from its robust digital infrastructure, vast consumer markets, and strong capabilities in funding, technology, and talent.

(III) Analysis Results by Regions

Sample countries with strong cross-border e-commerce competitiveness are primarily concentrated in Asia, Europe, and North America, where cross-border e-commerce policies, laws, and regulations are more developed, and the efficiency and facilitation of cross-border transactions are higher. These economies benefit from completed digital infrastructure, advanced payment systems, efficient logistics networks, and active international consumer markets, along with comprehensive reserves of capital, data, and talent. Considering geographic proximity and similar stages of development, this report categorizes the 55 countries into four regions: Asia and Oceania, North America, Europe, and South America and Africa.

The countries in Asia and Oceania demonstrate exceptional performance in involvement in international rules. Although development levels within the region vary, many sample countries actively participate in the formulation of international rules, even leading in certain aspects, particularly in digital trade rules closely

related to cross-border e-commerce. Several countries in Asia and Oceania are key initiators and signatories of multiple trade agreements, such as DEPA, RCEP, and CPTPP, establishing themselves as significant forces in shaping and promoting international rules related to cross-border e-commerce. Furthermore, the advanced digital infrastructure, developed electronic payment systems, and logistics networks in sample countries in Asia and Australia enable their cross-border e-commerce sectors to leverage geographic advantages and trade networks at the intersection of East and West, continually expanding into global markets.

A unified and comprehensive legal and regulatory framework has become an important factor in enhancing the competitiveness of cross-border e-commerce among European sample countries. The legal arrangements in Europe exhibit two main characteristics: uniformity and completeness. In terms of uniformity, the consistency of cross-border e-commerce policies, laws, and regulations among European countries is a distinctive feature of the region, providing a favorable institutional environment for the development of cross-border e-commerce. In terms of completeness, European countries possess a more comprehensive legal and regulatory framework for electronic payments, electronic signatures, and electronic contracts compared to other regions, with greater emphasis on consumer protection, personal data protection, and intellectual property rights. Additionally, they have enacted tax refund regulations related to cross-border e-commerce, providing significant legal support for the growth of cross-border e-commerce in Europe.

The economies in North America generally exhibit complementary advantages. Due to differing levels of development, North American countries show variations in domestic policies and regulations, customs clearance costs, and industrial foundation. More developed countries demonstrate better cross-border e-commerce business environments and stronger industry competitiveness, while less developed countries within the region rely significantly on major economies for their cross-border e-commerce regulatory frameworks and industry development. It is worth noting that, in terms of involvement in international rules, the relatively small number of countries in the region, along with the presence of major economic powers, makes it easier to coordinate international rule negotiations.

(IV) Analysis Results by Income

From the perspective of income levels in the sample countries, there is a strong positive correlation between GDP per capita and cross-border e-commerce competitiveness, particularly evident in the indicators of policies and laws, efficiency and facilitation, and competitiveness of trade markets. High-income countries⁸ generally demonstrate a higher level of development in cross-border e-commerce compared to middle- and low-income countries. The former benefit from robust economic strength, favorable policy environments, mature consumer markets, and extensive international cooperation, all of which drive the continuous enhancement of cross-border e-commerce competitiveness. In terms of the cross-border e-commerce policies, laws, and regulations indicator (shown as "Policies and Laws" in the chart) and the cross-border transaction efficiency and facilitation indicator (shown as "Efficiency and Facilitation" in the chart), there are significant gaps between middle- and low-income countries and high-income countries. Regarding industry competitiveness, the disparity between middle- and low-income countries and high-income countries primarily lies in competitiveness of trade markets (as illustrated in Figure 11).

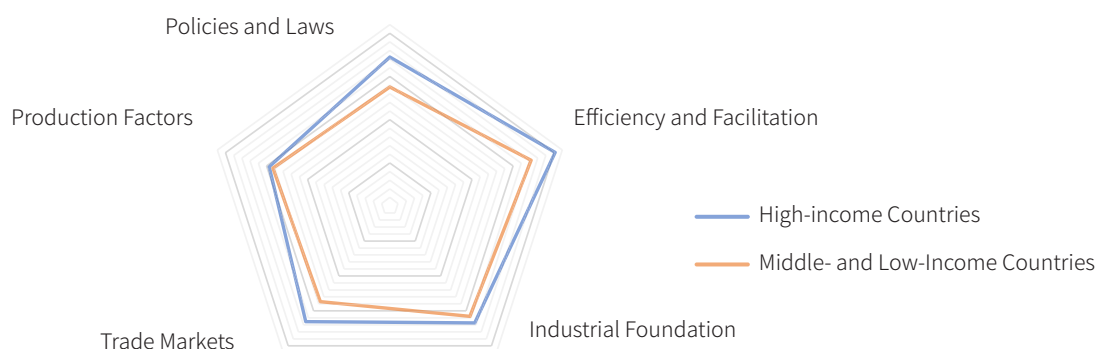


Figure 11: Comparison of High-income Countries with Middle- and Low-income Countries

High-income countries demonstrate similar advantages in cross-border e-commerce policies and laws, efficiency and facilitation, and trade markets. However, there are notable disparities in competitiveness concerning production factors and industrial foundation among these countries (see Figure 12). In a comprehensive and efficient business environment, high-income countries benefit from thriving international trade and achieve different levels of development in their cross-border e-commerce industries. Notably, **the United Kingdom** and **the United States of America** outperform the average

8. Classification of high-income, middle-income, and low-income countries is based on World Bank standards.
<https://blogs.worldbank.org/en/opendata/world-bank-country-classifications-by-income-level-for-2024-2025>

levels of high-income countries in terms of production factors and industrial foundation. Their vast financial markets, leading digital technologies, and well-developed higher education systems provide abundant production factors for the development of cross-border e-commerce. Additionally, robust digital infrastructure and mature air, sea, and rail transport systems actively connect their e-commerce industries to international markets, continuously strengthening their competitive edge. The UK government has also launched the National Broadband Scheme to ensure high-speed internet access, extending coverage to rural and remote areas, thereby creating favorable conditions for the growth of cross-border e-commerce. **Singapore** excels in policies and laws, as well as in efficiency and facilitation. The country's active involvement in international rules, favorable customs clearance costs, and well-developed public services provides solid support for the smooth operation of cross-border e-commerce. For instance, Singapore promotes electronic payment systems and consumer protection measures, ensuring the security of cross-border transactions and effectively enhancing consumer confidence and participation in cross-border shopping.

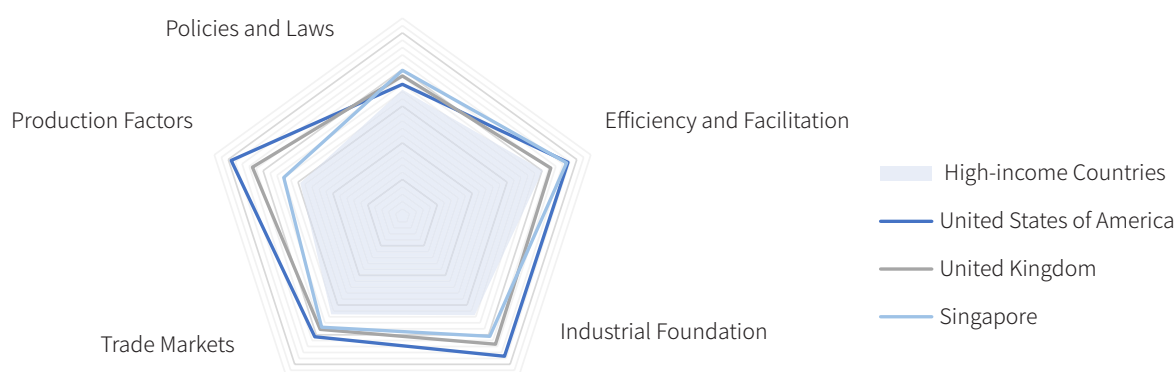


Figure 12: Comparison of Cross-Border E-Commerce Competitiveness Among High-income Sample Countries

There are significant disparities in the development of cross-border e-commerce among **middle- and low-income countries**, many of which have yet to establish comprehensive business environments. The competitive advantages of the cross-border e-commerce industry also vary by country (see Figure 13). Among them, **China** has experienced rapid development in cross-border e-commerce, with policies and regulations taking the lead. The country has formulated a series of policies, long-term development plans, and strategic blueprints closely related to the growth of e-commerce, which have driven the vigorous development of the cross-border e-commerce sector. In terms of production factors, China's vast domestic market, abundant data factor, and ample capital provide strong support for the digital, networked, and intelligent operations of cross-border e-commerce enterprises. **Mexico** boasts relatively comprehensive policies and strong competitiveness of production factors. The country actively participates in the formulation of international rules and has attracted numerous cross-border e-commerce companies and foreign investments, thanks to its unique geographic advantages, rapid economic growth, and large market space. Although its relatively less developed infrastructure somewhat limits consumer

participation in online shopping, Mexico's digital economy shows a positive development trend, promising significant potential for e-commerce growth. **Malaysia's** competitive advantages in cross-border e-commerce are primarily reflected in efficiency and facilitation. The government has implemented a series of incentive measures, innovative strategies, and regulatory frameworks to create a favorable business environment for e-commerce enterprises. In terms of policies and laws, Malaysia still needs to further refine its tax policies and engage more in the formulation of international rules. Malaysia places emphasis on the construction of infrastructure such as highways, ports, and airports, providing solid logistical support for cross-border e-commerce.

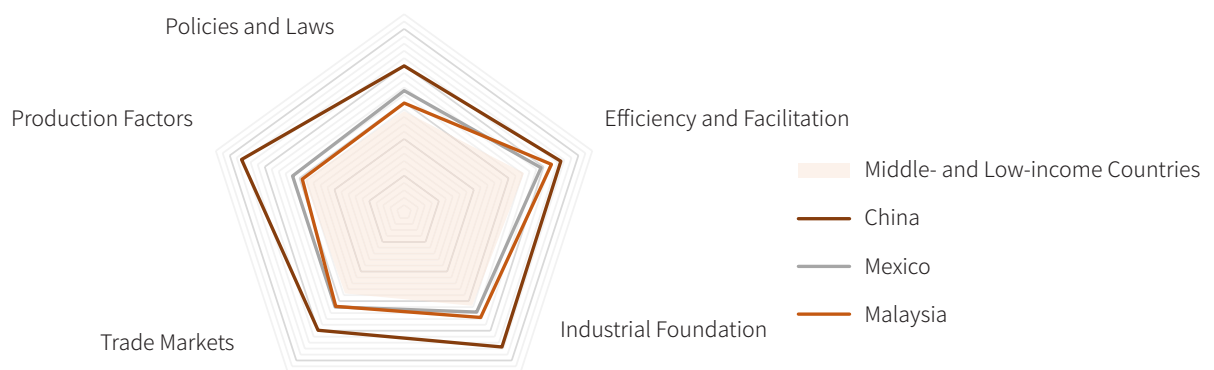


Figure 13: Comparison of Cross-Border E-Commerce Competitiveness Among Middle- and Low-income Sample Countries

In summary, the report provides a multi-faceted analysis of the cross-border e-commerce competitiveness of the sample countries. It examines competitiveness from various dimensions, including specific indicators, overall results, representative countries, and analyses based on region and income level, offering a comprehensive view of each country's current state of cross-border e-commerce competitiveness and typical practices. Overall, due to differences in development stages and institutional variations, countries demonstrate varied performances in business environments and industry competitiveness. Moving forward, relevant countries should enhance their overall cross-border e-commerce competitiveness by leveraging their comparative advantages and drawing on best practices from other countries' cross-border e-commerce development.

Appendix 1

Descriptions of Research Subjects and Indicators

(I) Research Subjects (Countries Sorted by World Bank Country Code in Alphabetical Order)

No.	Country	Code	Continent	No.	Country	Code	Continent
1	Argentina	ARG	South America	29	Japan	JPN	Asia
2	Australia	AUS	Oceania	30	Kenya	KEN	Africa
3	Austria	AUT	Europe	31	Cambodia	KHM	Asia
4	Belgium	BEL	Europe	32	Republic of Korea	KOR	Asia
5	Bulgaria	BGR	Europe	33	Lithuania	LTU	Europe
6	Brazil	BRA	South America	34	Luxembourg	LUX	Europe
7	Canada	CAN	North America	35	Latvia	LVA	Europe
8	Switzerland	CHE	Europe	36	Mexico	MEX	North America
9	Chile	CHL	South America	37	Malaysia	MYS	Asia
10	China	CHN	Asia	38	Netherlands	NLD	Europe
11	Colombia	COL	South America	39	Norway	NOR	Europe
12	Cyprus	CYP	Europe	40	New Zealand	NZL	Oceania
13	Czech Republic	CZE	Europe	41	Philippines	PHL	Asia
14	Germany	DEU	Europe	42	Poland	POL	Europe
15	Denmark	DNK	Europe	43	Portugal	PRT	Europe
16	Spain	ESP	Europe	44	Romania	ROU	Europe
17	Estonia	EST	Europe	45	Russia Federation	RUS	Europe
18	Finland	FIN	Europe	46	Rwanda	RWA	Africa
19	France	FRA	Europe	47	Singapore	SGP	Asia
20	United Kingdom	GBR	Europe	48	Slovakia	SVK	Europe
21	Greece	GRC	Europe	49	Slovenia	SVN	Europe
22	Croatia	HRV	Europe	50	Sweden	SWE	Europe
23	Hungary	HUN	Europe	51	Thailand	THA	Asia
24	Indonesia	IDN	Asia	52	Turkey	TUR	Europe
25	India	IND	Asia	53	United States of America	USA	North America
26	Ireland	IRL	Europe	54	Uzbekistan	UZB	Asia
27	Israel	ISR	Asia	55	South Africa	ZAF	Africa
28	Italy	ITA	Europe				

(II) Descriptions of Business Environment Indicator System and Indicator

Primary Indicators	Secondary Indicators	Tertiary Indicators
1. Cross-Border E-Commerce Policies, Laws, and Regulations	1.1 Domestic Policies, Laws and Regulations	1.1.1 Existence of policies related to e-commerce development and their openness
		1.1.2 Existence of laws and regulations related to electronic contracts and their openness
		1.1.3 Existence of laws and regulations related to electronic signatures and their openness
		1.1.4 Existence of laws and regulations related to electronic payments and their openness
		1.1.5 Existence of laws and regulations related to the "single window" system
		1.1.6 Existence of regulations related to the customs clearance process for small parcels
		1.1.7 Existence of laws and regulations related to cross-border logistics and their openness
		1.1.8 Minimum exemption threshold for taxes on cross-border imported goods/items
		1.1.9 Existence of tax refund laws and regulations related to cross-border e-commerce
		1.1.10 Existence of laws and regulations related to foreign exchange settlement and their openness
		1.1.11 Existence of laws and regulations related to intellectual property protection, personal information protection, and consumer protection in cross-border e-commerce
	1.2 Involvement in International Rules	1.2.1 Adoption of domestic legislation based on or influenced by relevant UN model laws, such as the <i>Model Law on Electronic Signatures</i> , <i>Model Law on Electronic Commerce</i> , and <i>Model Law on Electronic Transferable Records</i>
		1.2.2 Signature status of the United Nations <i>Convention on the Use of Electronic Communications in International Contracts</i>
		1.2.3 Concerns related to cross-border e-commerce or e-commerce in WTO Trade Policy Reviews
		1.2.4 Participation and negotiation status in the WTO Joint Statement on E-Commerce
		1.2.5 Number of participating trade agreements, including agreements with e-commerce provisions and those with independent e-commerce chapters
		1.2.6 Number of preferential trade agreements containing data flow provisions
2. Efficiency and Facilitation of Cross-Border	2.1 Customs Clearance Costs	2.1.1 Average tariff rate on cross-border e-commerce products
		2.1.2 Number of countries with mutual recognition agreements for the Authorized Economic Operator (AEO) program
		2.1.3 Indirect tax rates on cross-border e-commerce products (including vat, sales tax, or goods and services tax)
	2.2 Public Services	2.2.1 Existence of a "single window" platform
		2.2.2 Existence of capability enhancement plans for cross-border e-commerce

1.1.1 Existence of policies related to e-commerce development and their openness:

whether a country has implemented relevant policies to promote e-commerce development, and measures whether these policies are enacted independently and the degree of their openness.

Data Source: Government websites of the countries, as of 2024.

1.1.2 Existence of laws and regulations related to electronic contracts and their openness:

whether a country has enacted laws and regulations related to electronic contracts and measures whether these laws are independently established and the degree of their openness.

Data Source: Websites of business ministries, parliaments, and judicial departments of the countries, as of 2024.

1.1.3 Existence of laws and regulations related to electronic signatures and their openness:

whether a country has enacted laws and regulations related to electronic signatures and measures whether these laws are independently established and the degree of their openness.

Data Source: Websites of business ministries, parliaments, and judicial departments of the countries, as of 2024.

1.1.4 Existence of laws and regulations related to electronic payments and their openness:

whether a country has implemented laws and regulations related to electronic payments and measures whether these laws are independently established and the degree of their openness.

Data Source: Central bank and judicial websites of the countries, as of 2024.

1.1.5 Existence of laws and regulations related to the "single window" system: whether

a country has enacted laws and regulations regarding the "Single Window" system.

Data Source: Customs websites, parliamentary websites, and judicial websites of the countries, as of 2024.

1.1.6 Existence of regulations related to the customs clearance process for small parcels:

whether a country has established clear customs clearance processes for small parcels (also referred to as low-value parcels).

Data Source: Customs websites, parliamentary websites, and judicial websites of the countries, as of 2024.

1.1.7 Existence of laws and regulations related to cross-border logistics and their openness:

whether a country has enacted laws and regulations related to cross-border logistics and measures whether these laws are independently established and the degree of their openness.

Data Source: Customs websites, parliamentary websites, and judicial websites of the countries, as of 2024.

1.1.8 Minimum exemption threshold for taxes on cross-border imported goods/items: the minimum threshold for the taxation of customs duties on cross-border imported goods or items, converted to USD.

Data Source: Tax department websites or customs websites of the countries, websites of global express delivery associations, as of 2024.

1.1.9 Existence of tax refund laws and regulations related to cross-border e-commerce: whether a country has implemented regulations related to export tax refunds.

Data Source: Tax department websites or customs

websites of the countries, as of 2024.

1.1.10 Existence of laws and regulations related to foreign exchange settlement and their openness: whether a country has enacted laws and regulations related to foreign exchange settlement and measures whether these laws are independently established and the degree of their openness.

Data Source: Central bank websites or judicial websites of the countries, as of 2024.

1.1.11 Existence of laws and regulations related to intellectual property protection, personal information protection, and consumer protection in cross-border e-commerce: whether a country has implemented laws and regulations related to intellectual property protection, personal information protection, and consumer protection in the context of cross-border e-commerce.

Data Source: Intellectual property offices, customs websites, or judicial websites of the countries, as of 2024.

1.2.1 Adoption of domestic legislation based on or influenced by relevant UN model laws, such as the *Model Law on Electronic Signatures*, *Model Law on Electronic Commerce*, and *Model Law on Electronic Transferable Records*: whether a country has adopted the UNCITRAL *Model Law on Electronic Signatures* or has enacted relevant legislation in this field under its guidance, whether it has adopted the UNCITRAL *Model Law on Electronic Commerce* or has enacted relevant legislation under its guidance, and whether it has adopted the UNCITRAL *Model Law on Electronic Transferable Records* or has enacted relevant legislation under its guidance.

Data Source: UNCITRAL, as of 2024.

1.2.2 Signature status of the United Nations *Convention on the Use of Electronic Communications in International Contracts*: whether a country has become a signatory to the UNCITRAL *Convention on the Use of Electronic Communications in International Contracts*.

Data Source: UNCITRAL, as of 2024.

1.2.3 Concerns related to cross-border e-commerce or e-commerce in WTO Trade Policy Reviews: the concerns regarding e-commerce or cross-border e-commerce issues mentioned in WTO trade policy review documents.

Data Source: WTO, as of 2024.

1.2.4 Participation and negotiation status in the WTO Joint Statement on E-Commerce: whether a country is a participant in the WTO Joint Statement on E-Commerce and whether it is a member of the WTO e-commerce negotiation group.

Data Source: WTO documents on the Joint Statement on E-Commerce, WTO e-commerce thematic website, as of 2024.

1.2.5 Number of participating preferential trade agreements, including agreements with e-commerce provisions and those with independent e-commerce chapters: the number of regional and bilateral preferential trade agreements, the number of agreements that include e-commerce provisions, and the number of agreements with independent e-commerce chapters, etc.

Data Source: WTO Regional Trade Agreements Database, TAPED Database from the University of Lucerne, as of 2024.

1.2.6 Number of preferential trade agreements containing data flow provisions: the number of preferential trade agreements with data flow provisions included in the e-commerce chapter and the total number of preferential trade agreements that contain data flow provisions, etc.

Data Source: WTO Regional Trade Agreements Database, TAPED Database from the University of Lucerne, as of 2024.

2.1.1 Average tariff rate on cross-border e-commerce products: the average tariff rate applied by a country on imports related to cross-border e-commerce.

Data Source: World Bank WITS website, as of 2024.

2.1.2 Number of countries with mutual recognition agreements for the Authorized Economic Operator (AEO) program: the number of countries with which a country has signed mutual recognition agreements for the AEO program.

Data Source: World Customs Organization AEO website and official customs websites of the countries, as of 2024.

2.1.3 Indirect tax rates on cross-border e-commerce products (including vat, sales tax, or goods and services tax): the indirect tax rates (including VAT, sales tax, or goods and services tax) applied by a country on imports related to cross-border e-commerce.

Data Source: Tax websites of the countries, as of 2024.

2.2.1 Existence of a "single window" platform: whether a country has established a "Single Window" platform for trade.

Data Source: Customs websites of various

countries, WTO Operation of Single Window, as of 2024.

2.2.2 Existence of capability enhancement plans for cross-border e-commerce: whether a country offers training, exchanges, or other activities aimed at enhancing competitiveness in cross-border e-commerce.

Data Source: Websites of communications and commerce departments of the countries, as of 2024.



(III) Descriptions of Industry Competitiveness Indicator System and Indicator

Primary Indicators	Secondary Indicators	Tertiary Indicators
3. Competitiveness of industrial foundation	3.1 Digital Economy	3.1.1 Digital Economy Size
		3.1.2 International Bandwidth Usage
	3.2 Infrastructure	3.2.1 Telecommunications Infrastructure Index
		3.2.2 Integrated Index for Postal Development
		3.2.3 Logistics Performance Index
		3.2.4 Container Port Throughput
		3.2.5 Air Freight Volume
4. Competitiveness of Trade Markets	4.1 Consumer Markets	4.1.1 Proportion of Online Shoppers
		4.1.2 Proportion of Population Using Digital Payments
		4.1.3 Digital Payment Volume
		4.1.4 Enterprise E-Commerce Sales
	4.2 International Trade	4.2.1 Export Value of Major Cross-Border E-Commerce Goods
		4.2.2 Import Value of Major Cross-Border E-Commerce Goods
		4.2.3 Merchandise trade as a share of GDP
		4.2.4 Proportion of Cross-Border Shoppers among Online Shoppers
5. Competitiveness of Production Factors	5.1 Production Capital	5.1.1 Number of E-Commerce Companies
		5.1.2 Total Funding Amount of E-Commerce Companies
		5.1.3 Number of Cross-Border Warehousing Companies
	5.2 Data Factor	5.2.1 E-Commerce Adoption Rate Among Companies
		5.2.2 Number of Cross-Border E-Commerce Apps Launched
	5.3 Human Resources	5.3.1 Number of E-Commerce Employees
		5.3.2 Number of Institutions Offering E-Commerce Courses

3.1.1 Digital Economy Size (Billion USD):

the added value of the digital economy, encompassing two main components: digital industrialization and industrial digitization. The digital industrialization segment includes electronic information equipment manufacturing, sales and leasing of electronic information equipment, electronic information transmission services, computer services, software industries, other information-related services, and emerging industries driven by the broad integration of digital technology. Industrial digitization refers to the contribution of digital technology within the output of various traditional industries. Logarithmic transformation is applied in this study.

Data Source: China Academy of Information and Communications Technology (CAICT), 2022.

3.1.2 International Bandwidth Usage (Mbps):

the average usage of all international links, including fiber-optic cables, radio links, and traffic relayed to satellites via ground and telemetry stations. The data is based on a 12-month period for the reference year. If incoming and outgoing traffic volumes differ, the higher value should be used. Logarithmic transformation is applied in this study.

Data Source: International Telecommunication Union (ITU), 2017.

3.2.1 Telecommunications Infrastructure Index (TII):

an integrated index that measures the development status of telecommunications infrastructure. It considers the estimated number of internet users per 100 residents, mobile phone users per 100 residents, active mobile broadband users per 100 residents, and fixed broadband users per 100 residents. The Z-scores of these four indicators are averaged to produce the index.

Data Source: United Nations E-Government Survey, ITU, 2022.

3.2.2 Integrated Index for Postal Development:

an integrated index evaluating the relative performance of postal services in each country. It factors in postal reliability, coverage, importance, and resilience. Each component is normalized and then averaged, with the resulting score normalized again to yield a value between 0 and 100.

Data Source: Universal Postal Union (UPU), 2023.

3.2.3 Logistics Performance Index:

an integrated index providing benchmarks for trade logistics performance, to assess the ease of establishing reliable supply chains. It considers customs efficiency, quality of trade and transportation infrastructure, ease of arranging competitively priced shipments, quality of logistics services, ability to track shipments, and the frequency of goods reaching consignees within the scheduled time. The index ranges from 1 to 5, with higher scores indicating better performance.

Data Source: World Bank and Turku School of Economics, 2022.

3.2.4 Container Port Throughput (TEU):

the flow of containers between land and sea transport, measured in twenty-foot equivalent units (TEU). This data includes coastal shipping and international voyages and accounts for empty containers. Transshipment flows at intermediate ports are counted twice (for unloading and outbound loading). Logarithmic transformation is applied in this study.

Data Source: UN Trade and Development (UNCTAD), World Bank, 2022.

3.2.5 Air Freight Volume (Million Ton-Kilometers):

volume of cargo, express parcels,

and diplomatic mail carried during each flight segment (from takeoff to the next landing). This indicator is measured in metric tons multiplied by flight kilometers. Logarithmic transformation is applied in this study. Data is provided by the World Bank based on the International Civil Aviation Organization (ICAO) *World Civil Aviation Statistics* and ICAO staff estimates.

Data Source: World Bank, ICAO, 2021.

4.1.1 Proportion of Online Shoppers (%): percentage of respondents who made online purchases using a mobile device or the internet in the past year. The data is based on the Gallup World Poll conducted in 2021 and 2022, covering nearly 145,000 people across 139 economies, targeting civilian, non-institutionalized individuals aged 15 and above.

Data Source: The Global Financial Inclusion Database (Global Findex) of World Bank, 2021.

4.1.2 Proportion of Population Using Digital Payments (%): percentage of respondents who used mobile payments, debit or credit cards, or mobile accounts for payments, or used the internet to pay bills, purchase goods online, or in-store within the past year. Data is from the Gallup World Poll conducted in 2021 and 2022, covering nearly 145,000 people across 139 economies, targeting civilian, non-institutionalized individuals aged 15 and above.

Data Source: The Global Financial Inclusion Database (Global Findex) of World Bank, 2021.

4.1.3 Digital Payment Volume (Billion USD): transaction value of funds transferred by consumers from selected regions, including payments for goods and services via the internet, mobile POS payments, and cross-border transfers via the internet. Logarithmic transformation is

applied in this study.

Data Source: investigated and analyzed data from statistical offices, industry and trade associations, public institutions, private research companies, corporations and their exclusive partners, financial reports, and Statista (a widely used global comprehensive data platform), 2023.

4.1.4 Enterprise E-Commerce Sales (Billion USD): revenue from the sale of physical goods by businesses to private end consumers (B2C) in the e-commerce market. Statista estimates this based on annual filings, national statistics agencies, annual trends from Google and Alibaba, and industry knowledge, showing the share of online and onsite, personal computer and mobile sales. This figure includes value-added tax (VAT). Logarithmic transformation is applied in this study.

Data Source: Statista, 2023.

4.2.1 Export Value of Major Cross-Border E-Commerce Goods (Billion USD): total export value of major cross-border e-commerce goods (including food, beverages, tobacco, pharmaceuticals, electronics, vehicles, home furnishings, footwear, clothing, bags, photography equipment, optical products, watches, toys and sporting goods, stationery, art, jewelry, and musical instruments) categorized under the Standard International Trade Classification (SITC). Logarithmic transformation is applied in this study.

Data Source: UNCTAD, 2022.

4.2.2 Import Value of Major Cross-Border E-Commerce Goods (Billion USD): total import value of major cross-border e-commerce goods (including food, beverages, tobacco, pharmaceuticals, electronics, vehicles, home

furnishings, footwear, clothing, bags, photography equipment, optical products, watches, toys and sporting goods, stationery, art, jewelry, and musical instruments) categorized under the Standard International Trade Classification (SITC). Logarithmic transformation is applied in this study.

Data Source: UNCTAD, 2022.

4.2.3 Merchandise trade as a share of GDP (%): percentage of trade in goods relative to GDP, calculated by dividing the sum of exports and imports by the GDP value, all in current USD. The World Bank calculates this using WTO data and its GDP estimates.

Data Source: World Bank, WTO, 2022.

4.2.4 Proportion of Cross-Border Shoppers among Online Shoppers (%): percentage of individuals who made online purchases from foreign merchants out of the total number of online shoppers. Data is primarily sourced from EU surveys on household and individual ICT usage and regional survey reports compiled by Statista. When both sources are available, an average is used if there are discrepancies; when both are unavailable, other sources are used to supplement the data.

Data Source: Eurostat, Statista, DHL, 2023; J.P. Morgan, 2021.

5.1.1 Number of E-Commerce Companies: number of e-commerce companies with funding amounts exceeding one million USD. This indicator is estimated based on the number of companies in the e-commerce and e-commerce platform industry categories within the Crunchbase database that have raised over one million USD. Logarithmic transformation is applied in this study.

Data Source: Crunchbase, 2024. (Crunchbase is a widely used business information database, integrating portfolio data submitted monthly by over 4,000 investment firms worldwide).

5.1.2 Total Funding Amount of E-Commerce Companies (Billion USD): total funding amount for e-commerce companies with funding amounts exceeding one million USD. This indicator is estimated based on the total funding amount for companies in the e-commerce and e-commerce platform industry categories within the Crunchbase database that have raised over one million USD. Logarithmic transformation is applied in this study.

Data Source: Crunchbase, 2024.

5.1.3 Number of Cross-Border Warehousing Companies: number of warehousing companies engaged in international business. This indicator is estimated based on the number of companies in the warehousing industry category within the Crunchbase database that are involved in import-export and cross-border trade. Logarithmic transformation is applied in this study.

Data Source: Crunchbase, 2024.

5.2.1 E-Commerce Adoption Rate Among Companies (%): percentage of retail sales conducted by companies through the internet. This includes retail of physical goods conducted via desktop computers, tablets, or smartphones on websites or applications, as a share of total retail sales in 2023.

Data Source: ECDB, 2023. (ECDB is a widely used e-commerce database, with data primarily sourced from transactions on credit cards, debit cards, bank accounts, and e-wallets, as well as from publicly traded companies, traffic and click data, and web scraping and crawling data).

5.2.2 Number of Cross-Border E-Commerce

Apps Launched: number of shopping apps with international business capabilities. This indicator is estimated based on the total number of shopping apps that support two or more localized languages (including app interface language and app store metadata language) in the Appfigures database. Logarithmic transformation is applied in this study.

Data Source: Appfigures, 2024. (Appfigures is a widely used app development data platform, integrating data on app sales, advertising, and global ratings across major app stores, including the iOS App Store, Google Play, and Amazon Store).

5.3.1 Number of E-Commerce Employees:

total number of employees in publicly listed e-commerce companies. This is estimated based on the number of employees at publicly listed companies in the e-commerce and e-commerce platform industry categories in the Crunchbase database, Wind database statistics, and additional data published by major research institutions and media. Logarithmic transformation is applied in this study.

Data Source: Crunchbase, Wind, etc., 2024. (Wind is a widely used financial and information database that integrates the latest data on stocks, funds, bonds, foreign exchange, insurance, futures, financial derivatives, spot trading, macroeconomics, financial news, etc., with data from over 80 global securities research institutions).

5.3.2 Number of Institutions Offering

E-Commerce Courses: number of higher education institutions offering e-commerce-related courses. This is calculated via the total number of relevant institutions which

is estimated based on the list of institutions with e-commerce courses in the World Higher Education Database (WHED) and the Studyportals platform. Logarithmic transformation is applied in this study.

Data Source: World Higher Education Database (WHED), Studyportals, 2024. (WHED, in cooperation with UNESCO, provides authoritative information on all accredited or recognized higher education institutions that meet WHED standards. Studyportals is a widely used global higher education course search platform offering detailed information on bachelor's, master's, and doctoral programs).



Appendix 2

Data Processing Description

(I) Handling of Missing Values and Outliers

The data for each indicator used in this study primarily comes from government websites, statistics or survey data from authoritative international organizations, as well as from the working group's analysis of texts from government websites, widely used third-party databases, news data, and survey data. The study framework contains few indicators with missing values. For industry competitiveness in cross-border e-commerce, recent data for a small number of tertiary indicators is missing (accounting for only 3.3% of data points). These are supplemented with the latest lagged data or other reliable sources. For the few indicators for which data is entirely unavailable (accounting for 1.7%), they are excluded from the corresponding secondary indicator. In such cases, the score for the secondary indicator is calculated as the average of the other available tertiary indicators, with the overall impact of missing values on the study conclusions considered minimal.

Regarding outlier processing, scatter plots and indicator correlation matrices were used to conduct a secondary check on data accuracy, and no significant biases or errors were identified. In terms of data distribution, certain indicators tend to display a long-tail distribution, with the mean

noticeably higher than the median. To reduce the disproportionate influence of high values on indicator outcomes, logarithmic transformation (using the formula $\ln(x+1)$) was applied to indicators with high skewness ($\text{skewness} > 2$) and high kurtosis ($\text{kurtosis} > 3.5$). This transformation, without altering the country ranking, ensures that the indicators remain largely comparable. For details on relevant indicators, see Appendix 1.

(II) Calculation Method for Research Results

In the competitiveness research results by country, the cross-border e-commerce competitiveness S_a of country a is obtained by averaging the results of the business environment S_a^1 and industry competitiveness S_a^2 . Referring to common international research practices, the indicator system at each level adopts a layered additive approach: after determining the dimensionless results of each tertiary indicator Q_{ai}^1 , and Q_{aj}^2 , the corresponding weights of each indicator within the business environment index or industry competitiveness index are applied, and a weighted sum is calculated to

obtain the overall research result. Specifically, the cross-border e-commerce competitiveness result S_a for country a is calculated as the average of the business environment score S_a^1 and the industry competitiveness score S_a^2 . Under each framework, the scores of all 22 tertiary indicators and Q_{ai}^1 are Q_{aj}^2 multiplied by their respective weights ω_i^1 and ω_j^2 summed. The formula is as follows:

$$S_a = \frac{1}{2} \left(\sum_{i=1}^{i=22} \omega_i^1 \times Q_{ai}^1 + \sum_{j=1}^{j=22} \omega_j^2 \times Q_{aj}^2 \right)。$$

(III) Data Nondimensionalization Method

Due to the different units and ranges of values among indicators, the variables within indicators are non-dimensionalized to ensure the effectiveness of the synthesized results. This report applies the normalization method, commonly used in international research frameworks, to process continuous variables.

Specifically, in the business environment indicator system, positive indicators are calculated as follows:

$$Q_{ai}^1 = \left(\frac{q_{ai}^1 - q_{i,min}^1}{q_{i,max}^1 - q_{i,min}^1} \right) \times 70 + 30,$$

Negative indicator is calculated as follows:

$$Q_{ai}^1 = \left(\frac{q_{i,max}^1 - q_{ai}^1}{q_{i,max}^1 - q_{i,min}^1} \right) \times 70 + 30。$$

The formula for industry competitiveness indicators is:

$$Q_{aj}^2 = \left(\frac{q_{aj}^2 - q_{j,min}^2}{q_{j,max}^2 - q_{j,min}^2} \right) \times 70 + 30。$$

where Q_{ai}^1 and Q_{aj}^2 represents the original value of the tertiary indicator for cross-border e-commerce business environment or industry competitiveness in a given country. $q_{i,max}^1$ and $q_{j,max}^2$ represents the maximum value across all countries in the sample for the corresponding indicator. $q_{i,min}^1$ and $q_{j,min}^2$ represents the minimum value. Q_{ai}^1 and Q_{aj}^2 represents the standardized result after normalization.

This report also uses the Z-score normalization and other techniques to standardize indicators, achieving results similar to those obtained through the normalization method. Therefore, the results obtained through normalization in this report are considered robust.

Postscript

Cross-border e-commerce is one of the key areas of focus for World Internet Conference(WIC). WIC members encompass enterprises and related institutions from various segments of the global e-commerce industry chain. In June 2023, WIC established a Cross-Border E-Commerce Working Group aimed at uniting forces from all sectors to conduct in-depth research on the industry's current state and challenges, leveraging the WIC platform to deliver outcomes beneficial to industry development.

After the working group was established, Secretary-General Ren Xianliang led a team of experts on visits to Hangzhou, Shanghai, Jinhua, Yiwu, Guangzhou, and Shenzhen to investigate cross-border e-commerce industry practices. The group also studied and summarized the development trends and challenges facing the global cross-border e-commerce regulatory system. During the 2023 Wuzhen Summit, the working group released the *Report on Developments of International Normative Systems on Cross-Border E-commerce*, proposing eight recommendations and three actions to promote the development of cross-border e-commerce and enhance relevant international regulatory frameworks. In April 2024, WIC held the Digital Silk Road Development Forum in Xi'an, Shaanxi, where the working group, after extensive industry consultation, released the *2024 World Internet Conference Collection of Cross-Border E-Commerce Practice cases*.

Given the lack of authoritative publications that objectively reflect the global development landscape of the cross-border e-commerce industry, WIC decided at the beginning of this year to conduct more in-depth research on cross-border e-commerce to create a high-impact international public good. Following investigations into international organizations such as WTO, the UNCTAD, OECD, and the World Bank, a research framework was established.

In April 2024, during the Digital Silk Road Development Forum in Xi'an, WIC organized a seminar on cross-border e-commerce competitiveness research. The seminar brought together over 20 experts with extensive theoretical and practical experience in cross-border e-commerce and competitiveness research from international organizations, universities, research institutions, and leading enterprises. The participating experts unanimously agreed that conducting research on cross-border e-commerce competitiveness would be beneficial to the global cross-border e-commerce industry

and recommended conducting studies from both national and corporate perspectives.

WIC assembled industry experts to integrate insights from field research and seminar discussions. Following detailed data mining and analysis, an initial draft of the report was created. Throughout this process, multiple industry seminars were held to gather and incorporate feedback from relevant experts, ultimately producing three research reports on cross-border e-commerce competitiveness, focusing on countries, platform enterprises, and logistics companies.

During the preparation of this report, we received enthusiastic support from members of the Cross-Border E-Commerce Working Group and industry experts. We hereby extend our heartfelt gratitude to the experts who contributed their wisdom and professional insights to this research.

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This research represents WIC's initial attempt at competitiveness studies. Throughout the process, we recognized the diversity of cross-border e-commerce industries across countries and the complexity of the global industrial landscape, particularly the significant disparities among economies in terms of data foundations and transparency. We will continue to deepen our understanding and knowledge of the industry, consistently producing more in-depth and systematic research outcomes to support inclusive and sustainable global development.

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