

# Opportunities, Challenges and Development of Digital Trade in China's Belt and Road System

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**Abstract:** Digital trade is a new engine to stimulate economic growth along the "the Belt and Road" and an important starting point to promote the digital "the Belt and Road". Digital technology has created a new growth point of international trade. China's industrial advantages in digital trade, the leading mode of non-governmental organizations, and the digital development strategies of economies along the line have created a good foundation for China to promote the development of digital trade along the "the Belt and Road". However, the fragmentation of digital trade rules, unbalanced development of digital infrastructure, digital security and other issues facing the promotion of the "the Belt and Road" digital trade cannot be ignored.

**Keywords:** The Belt and Road Initiative Digital trade; Economic development Digital Fundamentals

## 1. Introduction

With the rapid development of new digital technologies has had a disruptive impact on international trade, investment, and global production layout. According to the "Digital Trade Development and Cooperation Report 2022" released at the 2022 Service Trade Fair, in 2021, the global cross-border digital service trade scale has exceeded 3.8 trillion US dollars, a year-on-year increase of 14.3%, accounting for 63.6% of service trade. Among them, the total import and export value of digital services in China reached 359.69 billion US dollars, a year-on-year increase of 22.3%, accounting for 43.2% of the total import and export of services, as shown in Fig.1. China's digital trade is developing rapidly, with its scale and growth rate ranking among the top in the world. In this era, China and the economies along the "the Belt and Road" continue to deepen international cooperation in the digital field, establish the "Digital Silk Road" cooperation mechanism and the "Silk Road E-commerce" bilateral cooperation mechanism, and complete the construction of several international submarine optical cables and cross-border land cables.

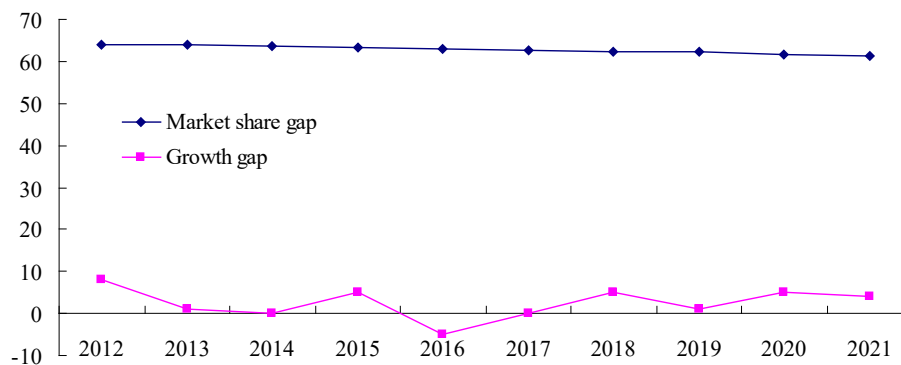


Figure 1: 2012-2021 Development of Digital Trade in Developing and Developed Countries

## 2. Opportunities to promote the development of "the Belt and Road" digital trade

1) Technology empowerment: digital technology creates new growth points for international trade

Firstly, digital technology has increased the proportion of information technology products and digital technology intensive products in goods trade. The innovation of digital technology has driven

the global information technology industry to achieve leapfrog growth, and information technology product trade has become one of the fastest-growing sectors in global trade. According to statistics, the total import and export volume of global information technology products in 2016 has reached three times that of 1996, accounting for 15% of the total import and export volume of global goods trade. In addition, from the perspective of trade costs, the reduction effect of digital technology on trade costs depends on the structure of trade costs and the proportion of digital costs, with the most significant impact on transportation costs, regulatory costs, information costs, and transaction costs. Therefore, the application of digital technology will significantly increase the proportion of time sensitive goods, certification intensive goods, and contract intensive goods in traditional goods trade.

Secondly, the development of digital technology has driven the rapid development of "digitalizable" service trade, while also giving birth to new types of service trade. As shown in Table 1, from 2012 to 2021, the proportion of service trade in international trade increased from 18% to about 23%, and the proportion of service trade in value-added trade reached around 50%. The significant growth of service trade is highly related to the rapid development of digital technology. On the one hand, the development of digital technology has formed a stable and fast digital infrastructure, and trade in "digitalizable" services such as information and computer services, telecommunications services, and other commercial services has achieved tremendous development, with a growth rate far exceeding that of traditional service industries such as tourism and transportation[1]; On the other hand, the development of digital technology has greatly reduced communication and transaction costs, reduced the constraint of spatial distance on international trade, and evolved traditional offline services such as education and healthcare into new online services, creating a new mode of service trade delivery and expanding the types of services for cross-border transactions. In addition, with the exponential growth of computing power, communication network bandwidth, and information processing capabilities, digital technologies such as artificial intelligence, the Internet of Things, 3D printing, and blockchain have emerged and gradually matured, leading to the emergence of innovative service trade types such as big data analysis, network security solutions, and remote quantum computing services.

Table 1: Global and Chinese Digital Service Exports from 2012 to 2021

Year	Global digitalizable service export scale (billions of US dollars)	Global digitalizable service export scale (billions of US dollars)	Global digitalizable service export scale (billions of US dollars)	Global digitalizable service export scale (billions of US dollars)	Global digitalizable service export scale (billions of US dollars)
2012	22.2	48.3	0.7	3.3	36.5
2013	23.9	48.8	0.8	3.5	39.9
2014	26.1	49.7	1.0	3.8	45.2
2015	25.3	50.5	0.9	3.7	42.7
2016	26.2	51.4	0.9	3.6	44.7
2017	28.3	51.1	1.0	3.6	45.0
2018	31.4	51.4	1.3	4.2	48.7
2019	32.9	52.3	1.4	4.4	50.7
2020	33.4	64.5	1.5	4.6	55.0
2021	38.1	62.8	1.9	5.1	49.7

2) Complementary advantages: China's digital trade industry advantages meet the needs of economies along the "the Belt and Road"

Digital intensive industries related to digital trade have significant economies of scale and economies of scope effects. With the expansion of the number of users, market size and the frequency of data use, their service quality will grow exponential growth[2]. China's industrial advantages in digital infrastructure, investment and financing services, logistics services, digital payment services and other fields are highly compatible with the economies along the "the Belt and Road". From the supply side perspective, the large market effect in China provides a vast experimental space for digital technology research and development, and provides rich experience for domestic digital enterprises to expand overseas markets. Specifically, China has strong offensive interests in industries that rely on digital technology to upgrade traditional goods trade, such as logistics services and digital payment services, as well as in areas with first-mover advantages such as digital infrastructure and 5G standard formulation. Among them, in the field of logistics services, China has initially formed a global network of overseas warehouses. The number of overseas warehouses in North America, Europe, Asia and other regions accounts for 90% of China's overseas warehouses. China has initially established transportation and sales channels for Chinese brands, effectively alleviating international logistics congestion. In

terms of digital payment, China's digital payment services are hardware neutral, which creates convenient conditions for digital payment software to increase penetration in overseas markets. In terms of investment and financing, China has provided more financing for the development of ICT in the economies along the "the Belt and Road" than all multilateral institutions and large economies. At the same time, digital payment services have provided new financing channels for SMEs along the "the Belt and Road" and lowered the threshold for financing access. In terms of standard setting for new technologies, China has actively joined 5G standard setting institutions and international cooperation projects such as the Third Generation Partnership Project (3GPP) and the United Nations International Telecommunications Union to support the participation of Chinese industry in standard setting, thereby promoting the internationalization of China's preferred 5G standards, Enable domestic related products in China to gain a first mover advantage in the process of promoting them to the international market[3].

From the demand side, the demand side characteristics of the economies along the "the Belt and Road" coincide with the product capabilities and service experience of Chinese digital enterprises. This is mainly reflected in three aspects: First, the average Internet penetration rate of the economies along the "the Belt and Road" is only 59.86%, and their network environment is poor, requiring high experience in upgrading service versions. Therefore, the economies along the "the Belt and Road" need to take the construction of digital infrastructure as the guide, improve Internet penetration and service quality. Second, the economies along the "the Belt and Road" have strong demand for electronic payment and inclusive finance. In 2020, the proportion of domestic consumers in the economies along the "the Belt and Road" that have personal bank accounts is only 56.73%. A large number of consumers lack credit accumulation and cannot access bank credit financial services. Third, SMEs along the "the Belt and Road" have a high demand for supply chain cooperation ecology. The transnational digital platforms in the United States and Europe mainly serve large transnational corporations, while the digital platforms in China take into account the internal needs of large enterprises and small, medium-sized and micro enterprises at the same time, and promote the replication and promotion of mature digital technologies, management models, application scenarios, etc. to small, medium-sized and micro enterprises through modular technology means, with advantages such as low cost, short upgrade time cycle, etc..

3) Mechanism innovation: led by non-governmental organizations to reduce political bias in economies along the route

Innovative technologies and new business models led by private Internet enterprises continue to be exported, becoming an important force in building the digital "the Belt and Road". For example, in terms of cross-border e-commerce, Alibaba Group's B2C website "AliExpress" for the international market has over 150 million overseas buyers, covering over 200 countries and regions worldwide, and has become the third largest English online shopping website in the world [4]. In addition, Alibaba Group has created the first eWTP "pilot zone" outside of China in Malaysia, building a "digital free trade zone" to provide logistics, warehousing, customs clearance, trade, finance and other "one-stop" comprehensive foreign trade services for cross-border trade of small and medium-sized enterprises. In terms of cloud services, "Alibaba Cloud" services have established data centers in Hong Kong, Singapore, Dubai, Europe and other countries and regions along the "the Belt and Road". At the same time, Alibaba Group utilizes its self-developed large-scale computing operating system to connect millions of servers worldwide and provide computing power to society through online public services.

4) Strategic alignment: China and the economies along the "the Belt and Road" align their digital trade development strategies

On the one hand, the development of digital trade is an important breakthrough in China's economic transformation and upgrading, which is in line with the top-level design of China's digital economy strategy. On the other hand, the development of digital trade will promote SMEs to participate in the international division of labor, integrate into the global value chain, and create jobs. For this reason, economies along the "the Belt and Road" have successively launched digital development strategies with different focus. Especially after the COVID-19 outbreak, the economies along the "the Belt and Road" urgently need to seek new economic growth points, and digital trade has become the most likely force to support the economic recovery and development of countries. For example, in March 2020, Kazakhstan adjusted its national plan for "Digital Kazakhstan", focusing on developing financial technology and building information and communication infrastructure. In September 2020, Egypt introduced the "Digital Egyptian Builders" program, which provides talent support for realizing Egypt's digital vision through cooperation with internationally renowned universities and ICT enterprises. In March 2021, Saudi Arabia established the Digital Government Authority, which will focus on building

an e-government network including platforms, websites, and services, accelerating Saudi Arabia's efforts to become a leading digital country.

### 3. Major challenges to the development of digital trade along the "the Belt and Road"

#### 1) Fragmentation of digital trade rules

Digital trade issues started late in the economies along the "the Belt and Road", and their penetration rate is lower than the global average. Although the depth of commitment has significantly improved in recent years, the overall level is still low. From a subregional perspective, the penetration rate of digital trade issues in the Asian economies along the "the Belt and Road" is higher than that in other regions. ASEAN members are important participants in the construction of the "the Belt and Road" digital trade rules, and Singapore, China and Vietnam dominate the construction of the "the Belt and Road" digital trade rules. From the perspective of the rule building mode, the main mode of the digital trade rule building of the economies along the the Belt and Road is to sign trade agreements with non the Belt and Road economies outside the region. From the content of the issue, digital trade rules show significant heterogeneity among the economies along the "the Belt and Road", and the "the Belt and Road" is facing fierce competition for the dominance of digital trade rules. Singapore has officially introduced the concept of "digital economy" to the economies along the "the Belt and Road". The Digital Economy Partnership Agreement has promoted not only covers traditional paperless trade, digital payment, unlicensed commercial electronic information, online consumer protection, SME cooperation and other issues, but also further promotes cross-border data flow, the location of computing facilities, non-discriminatory treatment of digital products New digital issues unique to the digital age, such as network security.

#### 2) Imbalanced development of digital infrastructure

Digital infrastructure is one of the key conditions for developing digital trade. Constrained by factors such as investment constraints, incomplete industry regulatory framework, and industrial decentralization, the infrastructure, innovation speed, and application capacity of digital infrastructure in the economies along the "the Belt and Road" are significantly behind the world average, and the economies along the "Belt and Road" have large differences. From the perspective of internet infrastructure, broadband networks with wide coverage, high-speed transmission, and low quality and price are the foundation for promoting the effective transformation of digital technology innovation into productivity, and are a new source of comparative advantage in digital trade[5]. The WTO (2017) conducted an investigation on four indicators reflecting the access proportion and access speed of fixed and mobile broadband Internet, and found that cross-border broadband access is highly correlated with income levels. The broadband access levels of economies along the "the Belt and Road" in Europe and Central Asia are higher than the world average, while South Asia, Africa and other regions are relatively backward, far below the world average. From the perspective of logistics infrastructure environment, with the rapid development of cross-border e-commerce, goods with low unit value and light weight have frequently become the subject of international trade, and the restrictive effect of logistics services on international trade has significantly increased. Especially for developing economies and small and medium-sized enterprises, the proportion of logistics costs in the final price of goods trade is as high as 26% and 42%, respectively. Therefore, reducing logistics costs will help developing economies and small and medium-sized enterprises achieve economies of scale and reduce export costs. This paper takes postal reliability index as the proxy variable of logistics facility environment index. The results are shown in Fig.1. Among the economies along the "the Belt and Road", the logistics facility environment of the economies along the "the Belt and Road" in Southeast Asia, East Asia, Europe, West Asia and Oceania is better than the world average. Among them, the logistics facility environment of South Korea, Singapore and other countries has reached the world leading level. However, North America, South America, Africa, South Asia and Central Asia are significantly lower than the world average level and the average level along the "the Belt and Road", especially the logistics facility environment of a large number of African and South American economies is almost in its infancy.

From the perspective of the digital payment environment, the settlement of credit cards or other real-time payment systems is a necessary step for the occurrence of digital trade. Digital payment will effectively reduce trade costs, improve transaction efficiency, and greatly enhance the opportunities for small and medium-sized enterprises to participate in international division of labor and integrate into the global production system. As shown in Fig.2, taking the proportion of bank accounts owned by

residents as the proxy indicator to reflect a country's digital payment environment, it is found that the digital payment environment of economies along the "the Belt and Road" is generally lower than the world average. From a regional perspective, the digital payment environment of economies along the "the Belt and Road" varies greatly, and Africa, South Asia, Central Asia and Southeast Asia are significantly lower than the average level along the "the Belt and Road".

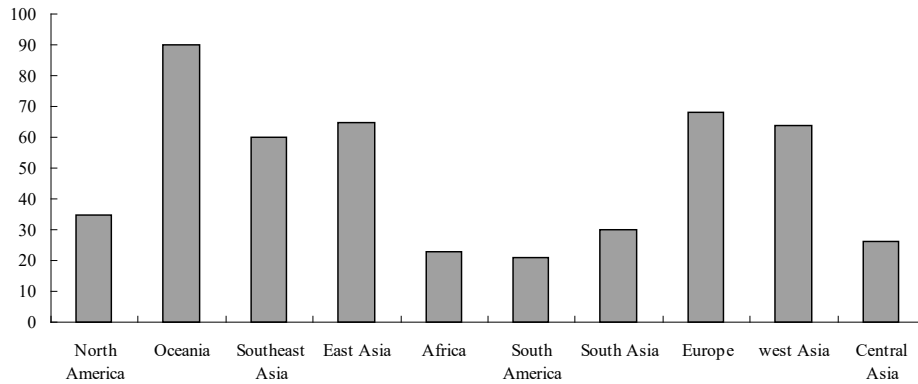


Figure 2: Logistics facilities environment of economies along the "the Belt and Road"

### 3) Digital security issues highlighted

In the era of digital economy, with the wide penetration of big data, cloud computing and the Internet of Things in different application scenarios, the cooperation field of economies along the "the Belt and Road" has gradually expanded to key basic industries related to the national economy and the people's livelihood, such as transportation, energy, electricity, water conservancy, which puts forward higher requirements for network security protection, as shown in Figure 3,

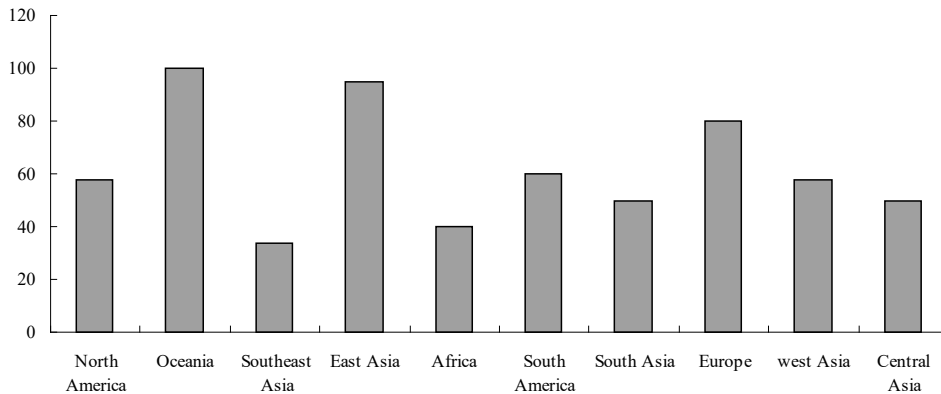


Figure 3: Digital payment environment of economies along the "the Belt and Road"

According to five indicators related to cybercrime and cyber security, including laws and regulations, technical capabilities, national strategies, capacity building, and institutional cooperation, the International Telecommunication Union (2021) has constructed the Global Cybersecurity Index. The results show that among the economies along the "the Belt and Road", about 40% of the economies have gradually incorporated cyber security issues into their commitments, and only 16% of the economies have made complex commitments on cyber security issues, Simultaneously participate in cybersecurity projects and initiatives. Specifically, as shown in Fig.4, the average level of network security of the economies along the "the Belt and Road" in Europe (82.44) and Asia (62.73) is higher than the world average (51.71), while that of the economies along the "the Belt and Road" in South America (41.06), Africa (38.71), North America (25.33) and Oceania (24.84) is significantly lower than the world average (51.71). Restricted by resources, technical level, network security ecosystem, R&D capability and political will, more than 40% of the economies along the "the Belt and Road" have not established a national response mechanism for network security incidents, and more than 2/3 of the economies along the "Belt and Road" have not established an industrial response mechanism for network security incidents.

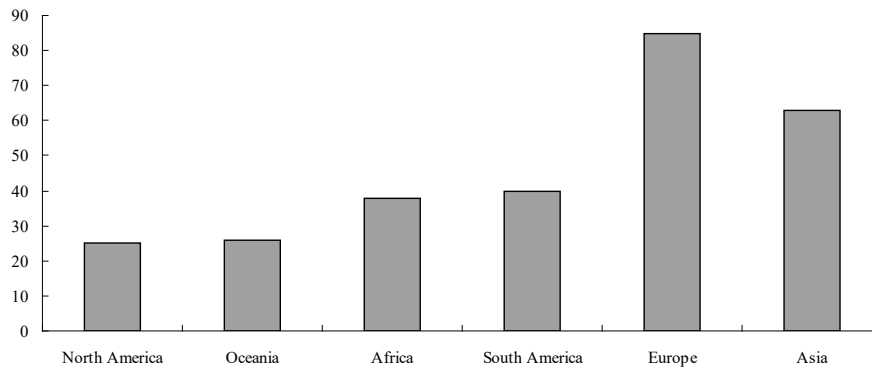


Figure 4: Network security level of economies along the "the Belt and Road"

#### 4. China's position and direction in promoting the development of "the Belt and Road" digital trade

##### 1) The basic position of promoting the development of digital trade along the "the Belt and Road"

China's promotion of digital trade along the "the Belt and Road" should be in line with China's current development stage. The significant differences among core economies in multilateral e-commerce negotiations reflect the different division of labor roles and development stages of different member states in the global e-commerce and digital trade industries. China's participation in the "the Belt and Road" digital trade development should clarify that the core advantage of China's digital industry at this stage is still online goods trade, as well as related warehousing, logistics, payment and other supporting services. China still has a certain gap with leading countries in high-tech value-added industries such as 3D printing, artificial intelligence.

China should take national security and public interests as the bottom line to promote the "the Belt and Road" digital trade. As a cross cutting issue, digital trade not only includes "border measures" such as customs tariffs and trade facilitation, but also includes "post border measures" such as innovation, intellectual property protection, and competition policy, as well as sensitive issues related to national security and public interests such as digital infrastructure, data flow, privacy, and internet openness. To promote the development of digital trade along the the Belt and Road, China should, on the basis of safeguarding national security and public interests, form good practices in line with the common interests of the economies along the the Belt and Road.

##### 2) Main directions for promoting the development of "the Belt and Road" digital trade

To promote the development of digital trade along the "the Belt and Road", China should base itself on industries and sectors with offensive interests, focus on upgrading traditional goods trade, and focus on improving the quality of digital services. At the same time, according to the domestic development level, industrial base and risk level of the economies along the "the Belt and Road", we will develop a differentiated promotion strategy to help Chinese digital enterprises expand their market share along the "the Belt and Road" and accelerate the export of Chinese digital trade rules along the "the Belt and Road".

First, take differentiated digital trade rules promotion strategies for economies along the "the Belt and Road" at different levels of development. Countries along the "the Belt and Road" have huge individual differences, including Southeast Asia, Oceania and other regions with high degree of digital trade freedom and relatively complete regulatory rules, such as Singapore, New Zealand, etc., as well as Africa, South Asia, Southeast Asia and other regions with poor digital trade foundation and missing regulatory rules, such as Laos, Myanmar, etc. For economies with relatively complete domestic regulatory rules and a strong digital industry foundation, China can refer to DEPA and seek multidimensional cooperation in areas such as trade facilitation, data protection, digital technology innovation, and cybersecurity to accelerate the integration of China with high standard digital trade rules. For economies with missing domestic regulatory rules and weak digital industry foundations, China should use issues such as minimum tariff reductions with lower levels of "integration", trade facilitation, digital signatures and authentication, online consumer protection, cooperation and capacity building assistance as a breakthrough to achieve the export of the Chinese version of e-commerce rules to the outside world. In addition, for economies along the route that have already signed bilateral or

regional trade agreements with China, China should actively seek to update and upgrade existing trade agreements, including e-commerce or digital trade clauses in the agreements, to hedge the potential threat of digital trade rules dominated by the United States, Europe, and Japan to China's trade, investment, and national security.

Second, accelerate investment in digital infrastructure in economies along the "the Belt and Road", deepen the Digital transformation of goods trade, and expand market access to "digital enabled" services such as logistics and electronic payment. China can take digital infrastructure investment as the guide, provide various high standard digital infrastructures such as data cables, 5G base stations, cellular networks, data storage centers, etc. for the economies along the "the Belt and Road", promote the facilitation of trade and investment, and gain the first mover advantage of developing digital trade along the "the Belt and Road". In addition, China's efforts to promote the development of digital trade along the the Belt and Road should be based on the core advantages of domestic digital giants. At the same time, China's best practices in the industrial layout, technical means, standards and systems of logistics services and electronic payment services should be used to expand the market access of digital enabled services in the economies along the the Belt and Road.

Third, strengthen the integration of the network security industry chain, build a national and enterprise linkage mechanism, and strengthen the network security cooperation between China and the economies along the "the Belt and Road". Compared with cybersecurity companies in developed economies such as the United States and the European Union, Chinese cybersecurity companies have a smaller competitive advantage. In this situation, on the one hand, China should speed up the integration of the network security industry chain, establish the cooperation mechanism of the network security enterprise industry chain, form an industrial synergy, enhance the international competitiveness of China's network security technology solutions through complementary advantages, and thus improve the market share of China's network security enterprises in the economies along the "the Belt and Road". On the other hand, the government should actively play a guiding role, build an interactive support platform for the government and enterprises, form a national and enterprise linkage mechanism, strengthen technical exchanges and strategic cooperation between Chinese cybersecurity enterprises and the economies along the "the Belt and Road", grasp the actual needs of the economies along the "the Belt and Road", and actively cooperate, participate in and support the national strategic layout of the economies along the "Belt and Road".

Fourthly, relying on international organizations and other non-binding platforms to promote various best practices. The advantages formed by China in cross-border e-commerce and other fields first come from innovation and initiatives at the enterprise level. This "bottom-up" exploration model effectively responds to the interests and demands of specific industries or departments, and has been highly recognized by international organizations and platforms. For example, at the beginning of 2016, Alibaba first proposed eWTP at the Boao Forum for Asia, and then the concept was formally written into the G20 Global Trade Growth Strategy. For example, China has actively participated in and guided the World Customs Organization to develop the "Cross border E-commerce Standard Framework", establishing a global standard framework for cross-border e-commerce. Therefore, in the process of promoting the development of digital trade along the "the Belt and Road", China should make full use of binding and non-binding platforms such as the World Trade Organization, the World Customs Organization and the Asia Pacific Economic Cooperation, implement various best practices formed in China's domestic free trade pilot zones and regional trade agreements such as RCEP, and accelerate the multilateralization of rules, technologies and standards in China's domestic industries or sectors. At the same time, actively cooperate in the development of various technical standards, industrial guidelines, regulatory regulations, etc. related to digital products and services, and strengthen China's leadership role in the "the Belt and Road" digital trade field.

## 5. Conclusion

With the development of digital technology, international trade and global production layout are gradually breaking through the constraints of time and space, presenting new features of intelligence, networking, and digitization. The proportion of information technology products and digital technology intensive products in goods trade has significantly increased, and the trade in "digitalizable" services has grown rapidly. At the same time, digital technology has created a new delivery model for service trade, giving rise to the emergence of new types of service trade. Digital technology has created new growth points for international trade. At the same time, relying on the large market effect in China, Alibaba, Tencent, Huawei and other Chinese private Internet enterprises have explored to form China's

own digital industry advantages and gradually infiltrate the economies along the "the Belt and Road". This advantage of China's digital industry led by non-governmental enterprises perfectly matches the development demands of the economies along the "the Belt and Road", effectively reduces the political bias of the economies along the line, and conforms to their digital economy development strategy. However, promoting the development of digital trade along the "the Belt and Road" faces multiple difficulties from the institutional level, infrastructure level and security level. For example, the global governance rules of digital trade are fragmentation, the Internet infrastructure, logistics facility environment and digital payment environment are developing unevenly along the "the Belt and Road", and network security has become one of the major global business risks.

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