Digital Trade in China and Its Implications

Park Kayoung

1. Introduction

New information and communication technologies have developed significantly, and now wield considerable influence on the traditional commodity trade. The concept of digital trade has emerged around the world and has drawn global attention. Digital trade is a form of trade in which information and communication technology plays an important role. The characteristics of digital trade are for the most part, twofold. First is the digitalization of the method of exchange. Information and communication technologies have changed the way traditional trade is conducted, and e-commerce platforms have become an important hub for international trade. Information display, trade negotiations, payments and settlements and tax clearance are done online, greatly reducing trade costs and improving efficiency. The second is the digitization of trade goods, that is, the digital services trade: data and products in the form of data. Services are traded globally through information and communication networks, and their impact on production and transaction continues to expand. Recently, new technologies such as cloud computing and big data continue to develop, and the content of digital trade is diversifying continuously, especially in China and the U.S. The importance of digital trade has also grown. Moreover, China has increased its digital trade and influence in different regions by promot-

Table 1. Scope of Digital Trade

Scope	Examples
Digital products	Software, electronic games, video, music, e-books, etc.
Digitized knowledge and information	Web search, website information, online social platforms, etc.
Goods traded on e-commerce platforms	Goods traded through Taobao, Amazon, Jingdong, etc.
Digital service	Communication, computer, information, insurance, finance, intellectual property rights, etc.

Source: Sheng and Sun (2020), "The Development of Digital Trade and the Evolution of its Rules".

ing its Belt and Road project. Accordingly, this paper seeks to grasp digital trade and analyzes the digital trade in China, dividing it into digital product (software) trade, digital service trade and e-commerce trade. This study concludes with a description of the implications for policy carried by the results of the analysis.

2. Software Exports

The growth rate of software exports is steady. Chinese software exports by execution amount increased by 9.8 percent to 41.2 billion USD in 2018. The total number of contracts amounted to 59,867, a decrease of 0.13 percent from 2017. Software exports on the contract amount declined 1.9 percent, from 57.2 billion USD in 2017 to 56.1 billion USD in 2018. This marked the first decline since 2010, and is considered to be due to the impact of trade frictions between the U.S. and China.

Exports of software products decreased, while information technology outsourcing increased. Exports of software products in 2018 amounted to 11 million USD, accounting for 2.7 percent of total software exports, a decrease of 3.5 percent compared to 2017. Recently, the export share of software products has decreased every year. Software made up 5.1 percent of exports in 2015 but just 2.7 percent in 2018. Information Technology Outsourcing (ITO) exports came to 401 billion USD, accounting for 97.3 percent of total, up 10.2 percent from the previous year. As for the export structure of information technology outsourcing, software R&D outsourcing is leading in terms of export size, and information technology service grew by 28.2 percent in 2018. The top five export recipients of Chinese software are U.S., EU, Hong Kong, Japan and Korea. These regions account for 70.1 percent of total software exports. Among the top 10 regions, the EU, Hong Kong, Germany, Japan,

Table 2. China's Software Exports

Unit: 1 bln USD, %

	Exports (on execution amount)	Growth rate (%)	Exports (on contract amount)	Growth rate (%)	Number of contracts	Growth rate (%)
2010	9.7	34.0	12.6	24.4	39,044	27.2
2011	14.3	47.4	19.1	51.1	46,159	18.2
2012	19.4	35.4	23.4	22.8	53,887	16.7
2013	25.4	30.6	32.1	36.9	52,683	-2.2
2014	30.1	18.5	37.7	17.6	52,265	-0.8
2015	33.4	11.1	42.6	12.9	52,173	-0.2
2016	34.2	2.5	46.5	9.2	52,790	1.2
2017	37.6	9.7	57.2	23	59,943	13.6
2018	41.2	9.8	56.1	-1.9	59,867	-0.1

Source: China Ministry of Commerce, Wang and Xie (2019), "Development and Prospect of Digital Trade and Software Export in China".

Table 3. China's Software Exports by Category

Unit: 100 mln USD, %

		Value	Growth rate (%)	Number of contracts	Growth rate (%)
Total		**412.3**	**9.8**	**59,867**	**-0.13**
Software product		**11.0**	**-3.5**	**4,436**	**-6.92**
	System software	2.1	-12.4	972	37.87
	Application software	8.2	-7.4	3,416	-15.21
	Support software	0.6	804.9	48	50.00
Information technology outsourcing (ITO)		**401.3**	**10.2**	**55,431**	**0.46**
	Software R&D	255.9	5.1	39,250	-3.95
	Information technology service	88.2	28.2	10,015	31.71
	Operations and management services	52.3	1.6	6,148	-8.24
	Cloud services	4.5	–	13	–

Source: China Ministry of Commerce, Wang and Xie (2019).

Korea and India recorded double-digit growth year-on-year.

The regions along the Belt and Road have great development potential for Chinese software. Countries along the Belt and Road have developed a small information technology industry, and the digital gap is large with advanced countries, but will be a new growth space for China's software exports. China's software exports to countries along the Belt and Road are lower than the global average. However, orders from the countries along the

Table 4. Top 10 Countries in Software Exports from China

Unit: 100 mln USD, %

	Value	Growth rate (%)	Number of contracts	Growth rate (%)
World	**412.3**	9.8	59,867	-0.13
U.S.	**92.1**	4.2	7,607	-2.29
EU (28countries)	**68.8**	15.5	8,489	2.08
Hong Kong	**56.1**	26.6	6,770	-3.47
Japan	**47.6**	16.2	14,323	-4.43
Korea	**24.3**	24.5	2,258	9.13
Singapore	**23.1**	5.1	1,760	6.28
Taiwan	**15.3**	-31.7	2,398	-18.66
Germany	**15.2**	26.4	1,763	-1.51
UK	**10.8**	7.7	1,446	-0.21
India	**8.1**	34.9	1,403	-13.5

Source: China Ministry of Commerce, Wang and Xie (2019).

Belt and Road increased from 13.8 percent in 2012 to 2018 to 16.9 percent. The average amount per case of software exports to China in 2018 was 690,000 USD, and the amount in the countries along the Belt and Road was 590,000 USD.

Software exports to the countries along the Belt and Road countries are mainly concentrated in Southeast Asia. Chinese software exports to Southeast Asia in 2018 amounted to 3.8 billion USD, accounting for 55 percent. West Asia and North Africa stood at 1.1 billion USD, South Asia at 10 billion USD, and the Commonwealth of Independent States (CIS) countries at 500 million USD. In terms of national distribution, the top five countries are Singapore (2.4 billion USD), India (800 million USD), Russia, Malaysia, and Indonesia (300 million USD in all three countries). These five countries accounted for 58 percent in China's exports to the regions along the Belt and Road.

3. Digital Service Exports

Although it is generally accepted that the digital service trade refers to the transaction of digital products and services provided through network transmission, there is no unified understanding of a specific service category or scope. According to the OECD, the trade in digital services involves the cross-border transmission and delivery of information and communications networks, including e-books, software, data and database services. UNCTAD defines digital services as service products provided remotely through information and communications networks (voice and data networks), and digital services trade as transaction of all services provided across borders through information and communications networks. The China Academy of Information and Communications Technology (CAICT) also includes data trade as well as digital products and service trade. According to China's Ministry of Commerce, the digital service trade is included in digital trade, and its development relies on digitalization. It includes new economic models or forms of business created by the digitalization of traditional service industries as well as technological advances. In summary, the digital service trade refers to cross-border service trade conducted online, and belongs to both digital trade and service trade.

Global digital service exports amounted to about 3 trillion USD in 2018, accounting for 50.2 percent of total service exports. That share has risen slightly every year, from 46.3 percent in 2010 to 50.2 percent in 2018. Table 5 shows an analysis of the world's eight major economies, comprising the U.S., EU, Japan, Australia, China, India, Russia and Brazil. U.S., EU, Japan, and Australia belong to the G7, while China, India, Russia, and Brazil are the BRIC countries. These regions represent blocs of developed and developing countries and major participants and decision makers in digital trade negotiations. The analysis of the eight countries reveals the gap in the total amount and structure of

Table 5. Digital Service Exports and the Rate in Service Exports

Unit: 1 tln USD, %

Year	Volume	Rate (%)	Year	Volume	Rate (%)
2009	1.7	47.7	2014	2.6	49.2
2010	1.8	46.3	2015	2.5	49.7
2011	2.1	47.1	2016	2.5	50.6
2012	2.1	47.3	2017	2.7	50.1
2013	2.3	48.2	2018	2.9	50.2

Source: UNCTAD, Yue and Li (2020), "Comparison of International Competitiveness of Digital Service Trade and Its Enlightenment to China".

digital services between the two economic blocs comprising developed and developing countries. Exports from the EU and the U.S., the top two countries in digital service exports, are worth 1,449 billion USD and 467 billion USD, respectively, accounting for 65.4 percent of global digital service exports. The U.S. and EU shares of global digital service exports has not changed much, dropping 0.2 and 0.7 percentage points in 2018, respectively.

Digital service exports from developing countries are insignificant compared to exports of developed countries. The proportion of digital service exports from China and India was 4.5 percent, and their shares 2014 and 2018 have changed little. At the same time, Russia and Brazil accounted for less than 1 percent of the world's digital service exports, and their shares are shrinking. The data shows that unlike in the traditional commodity trade, in the digital services trade, the market share and growth rate of developing countries are lower than those of developed countries.

In 2018, advanced economies accounted for 84.6 percent, 84.1 percent, and 73.9 percent of global market share in the information, intellectual property rights, and insurance and finance sectors, respectively. Developing countries' most dominant position was in the computer and management consulting sectors, where their market share stood at 22.4 percent and 11.4 percent, respectively. From 2014 to

Table 6. Digital Service Exports of Major Economies (2018)

Unit: 1 bln USD, %p, %

	U.S.	EU	Japan	Australia	China	India	Russia	Brazil
Value	467	1,449	106	16	131	133	21	21
Market share (%)	15.9	49.4	3.6	0.6	4.5	4.5	0.7	0.7
Market share change (%p) (2014-2018)	-0.2	-0.7	0.2	-0.1	0.6	0.1	-0.2	-0.3
Annual average growth rate (%) (2014-2018)	3.1	3.1	5.0	1.1	7.4	4.3	-3.4	-4.8

Source: UNCTAD, Yue and Li (2020).

Table 7. Global Market Share of Digital Service Trade

Unit: %

		Communication	Computer	Information	Insurance and finance	Intellectual property rights	Management consulting	Engineering R&D	Cultural entertainment
Advanced economies	U.S.	10.7	5.1	25.6	20.9	32.3	17.6	9.4	5.91
	EU	49.1	55.0	57.1	50.2	40.3	41.9	54.4	55.2
	Japan	1.4	0.6	0.7	2.2	11.3	1.7	4.3	1.2
	Australia	0.7	0.5	1.1	0.6	0.2	0.8	0.5	1.5
	Total	61.8	61.2	84.6	73.9	84.1	62.0	68.6	63.8
Developing countries	China	2.3	9.5	–	1.3	1.4	5.5	–	2.2
	India	2.6	11.7	0.9	1.3	0.2	9.3	2.4	3.4
	Russia	1.2	0.9	0.3	0.3	0.2	1.2	0.9	1.1
	Brazil	0.5	0.4	0.1	0.2	0.2	0.9	1.5	0.6
	Total	6.5	22.4	1.33	3.1	2.0	11.36	4.81	7.3

Source: UNCTAD, Yue and Li (2020).

2018, the market position of advanced economies remained generally stable. Sectors with considerable changes included the information (up 2.24 percentage points) and intellectual property rights (down 3.4 percentage points). Even in the case of developing countries, there was not much change. Cultural entertainment recorded an uptick of 1.8 percentage points, the intellectual property rights sector grew 1.3 percentage points, engineering R&D fell 0.8 percentage points and information services slid 0.4 percentage points. In terms of the market share China's digital services, computers (up 3.9 percentage points) and cultural entertainment (also up, 1.9 percentage points) expanded. Insurance and finance (down 0.2 percentage points), management consulting and engineering R&D (also down, 0.6 percent points) contracted slightly.

4. E-commerce Exports

According to iResearch and China Investment Consulting, the total size of cross-border e-commerce in China is expected to reach 8.8 trillion CNY in 2018 and 12 trillion CNY in 2020.

Cross-border e-commerce in China has developed rapidly. Growth engines, market structures and development models are actively changing and showing new features such as the overseas expansion of Chinese brands, live commerce, social commerce and local services. As relevant policies continue to evolve, cross-border e-commerce in China will continue to develop. The cross-border e-commerce continues a vigorous course of development. According to the Chinese customs agency, the total amount of e-commerce exports and im-

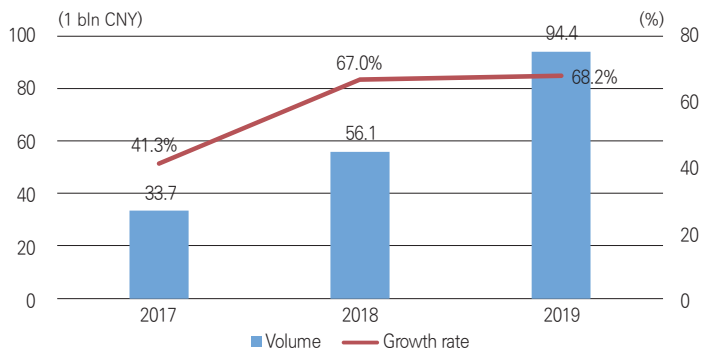
ports increased by 50.8 percent annually from 36 billion CNY in 2015 to 186 billion CNY by 2019, with year-over-year export growth of 38.3 percent. Exports increased by an average of 60.5 percent annually, from 34 billion CNY in 2017 to 94 billion CNY in 2019, up 68.2 percent from the previous year. Imports rose 27.4 percent annually, from 57 billion CNY in 2017 to 92 billion USD in 2019, up 16.8 percent from the previous year. In terms of the regional scale of cross-border e-commerce trade, the eastern coastal provinces lead all others. The top five regions in 2019 were Guangdong Province, Zhejiang Province, Henan Province and the cities of Shanghai and Tianjin. Of these, the scale of trade in Guangdong Province was much larger than the other regions. In detail, the top five cities are Guangzhou, Zhengzhou, Hangzhou, Changsha and Nanjing. In terms of the rate of increase, the development in the Midwest is very rapid. The top five provinces for growth are Hebei Province, Yunnan Province, Guizhou Province, Hunan Province and Hainan Province.

In addition to developed markets such as the EU and U.S., the countries of the Belt and Road initiative have fueled the explosive growth of cross-border e-commerce from China. E-commerce with major trade partners has gradually expanded, with increasing e-commerce transactions with countries along the Belt and Road are expected. In both the medium and long term, developing countries have great potential for digital trade development due to their huge market spaces and narrowing technology gaps. Cross-border e-commerce (B2B exports) in countries along the Belt and Road accounted for 12.5 percent of the global share. In December 2017, China, Egypt, Laos, Saudi Arabia, Serbia, Thailand, Turkey and UAE jointly initiated the Belt and Road digital economy international joint venture initiative. This laid the foundation for transnational cooperation in the digital economy focused on broadband quality, digital transformation, e-commerce cooperation and improvements in the online environment. The regions along the Belt and Road are fast-growing e-commerce markets, and China's cross-border e-commerce imports and exports continue to grow. As the Belt and Road project is implemented the business environment for e-commerce in the relevant regions has improved, and is expected to make a significant contribution to the expansion of foreign trade in China. Cross-border e-commerce trade between China, Cambodia, Kuwait, UAE and Austria in 2018 increased by 100 percent compared to the previous year. In particular, cross-border e-commerce in China's major cities along the Belt and Road is rapidly developing. According to a report released by the Zhejiang Provincial Office of Commerce in 2018, Fuzhou, Quanzhou and Guangzhou, which are along the maritime Silk Road, have been selected as the top 20 cities for e-commerce export development. In addition, Xi'an and Lanzhou, along the Belt and Road, were included among a list of cross-border e-commerce comprehen-

sive pilot areas in 2018.

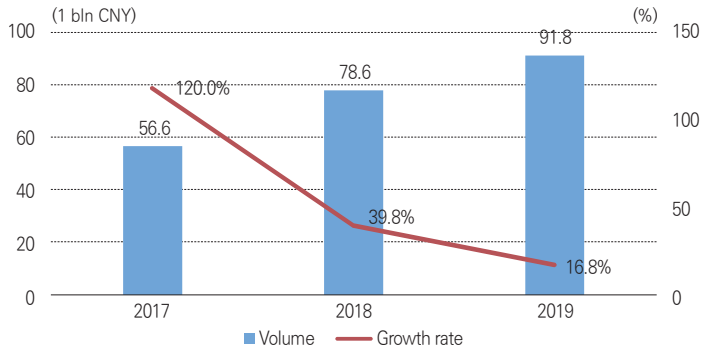
Silk Road e-commerce has become a new channel for bilateral cross-border e-commerce cooperation. Since the Ministry of Commerce officially proposed Silk Road e-commerce in 2017, it has deepened global economic and trade cooperation with the Belt and Road policy. In 2019, the Ministry of Commerce signed a memorandum of understanding on e-commerce cooperation with five countries, including Italy, Colombia, Samoa, Vanuatu and Uzbekistan. As of the end of 2019, 22 countries and China have signed memorandums of understanding on e-commerce cooperation and the cooperative partners cover the five continents. With said partners, the total amount of cross-border e-commerce was about 25 billion USD, an increase of 87.9 percent from the previous year. Exports increased by 207.1 percent, to 14 billion USD, and imports increased by 21.5 percent to 10 billion USD. In addition, cooperation in e-commerce infrastructure has intensified. In 2019, China strengthened cooperation in the field of e-commerce with the Middle East, ASEAN, and South America. It has made active progress by promoting various businesses such as overseas e-commerce, overseas warehouses, big data, and logistics construction. The Belt and Road has become a new direction for the development of cross-border e-commerce in China. In addition, the Ministry of Commerce has organized seven bilateral e-commerce working groups with countries including Vietnam, Russia, and Estonia to promote mutual understanding of the framework on e-commerce regulations and industrial policies. The working groups discussed directions for cooperation and specific measures. Also, the Ministry of Commerce held high-level regular dialogues on Silk Road e-commerce with municipal authorities from Beijing, Shanghai, Harbin, Chengdu, and Xiamen. These regular dialogues included representatives from embassies and associations of partner countries, nationwide e-commerce platforms and local companies.

Figure 1. China's E-Commerce Exports by China Customs



Source: China Ministry of Commerce, China E-Commerce Report (2019).

Figure 2. China's E-Commerce Imports by China Customs



Source: China Ministry of Commerce, China E-Commerce Report (2019).

5. Implications

In the trade of digital services, the strengths of developed countries and weaknesses of developing countries are clearly seen. Unlike the traditional commodity trade, in the digital service trade, not only the market share of developing countries but also the rate of growth is lower than that in advanced economies. This is because digital services have high technical barriers and economies of scale. Therefore, it is difficult for developing countries to utilize sufficiently their superior labor and other resources as necessary to overcome those barriers and there is a limit to entering the global market and participating in the international division of labor.

China is focusing on the construction of the Digital Silk Road and making efforts to expand new spaces in the digital trade market. There is considerable demand for digital services in developing countries along the Belt and Road. Digital companies in China have tried to increase the level of digital infrastructure connections those countries through investment, service outsourcing and cross-border e-commerce. China intends to expand the scale of its trade in the region by establishing a network information service system to narrow the digital divide in developing countries. Accordingly, the use of China's technologies and standards contributes not only to market expansion but also to the strengthening of China's voice as a representative of developing countries in the establishment of global digital trade norms.

Korean companies have a good understanding of how digitization affects industry. E-commerce is a subject of great interest in the private sector, where it is utilized and in academia, where it is heavily studied. However, regarding the topic of digital trade, which has been discussed in earnest in the U.S. since the 2010s, companies are neither as aware nor as interested in the topic. In the United States, there are many multinational IT companies that have advanced overseas and continued de-

mand for trade standards in the digital realm, centering on those companies. Korea was relatively insensitive to the need for international standardization in the digital field. Having adopted this position, as internet-related businesses diversified and the consumer awareness of personal information protections grew, the country has strengthened and adopted regulations for data protection, rather than data use. It is necessary to keep an eye on digital trade standards at the government and corporate levels. Digital trade norms are relevant to all industries. It involves the accumulation, processing, storage and use of information or data in all production and transaction processes from research and development to design, production, sales, transportation and so on. Regulations such as cross-border movement of data and localization of data are not only applicable to IT and related service industries, but also affect all fields, including manufacturing. Recently there have been active discussions on the establishment of digital international trade norms. When digital international trade norms are created, the competitive environment and regulatory environment will undergo changes. Therefore, it is necessary for the Korean government and enterprises to understand digital trade norms, consider the direction of digital trade in Korea and adopt a position in the process of establishing digital international trade norms.

Park Kayoung | Researcher | Northeast Asia Industry Division | Park99@kiet.re.kr