

The impact of digital trade facilitation on China's cross-border e-commerce exports

Xiao Aimei¹

¹Zhejiang University of Science and Technology, Hangzhou, 310000, China

Keywords: Digital trade, Trade facilitation, Cross-border e-commerce, RCEP

Abstract: Starting from the development status of digital trade in RCEP member states, the paper studies the impact of digital trade facilitation on China's cross-border e-commerce exports. Based on the data of RCEP member states from 2012 to 2021, an evaluation system for the level of digital trade facilitation is constructed. The expanded gravity model and fixed effect model are used to explore the impact of digital trade facilitation on China's cross-border e-commerce exports. The research results show that during the decade, the digital trade facilitation level of RCEP member states is generally on the rise. There is a significant positive relationship between the degree of digital trade facilitation of RCEP member states and China's cross-border e-commerce exports, which means when the degree of digital trade facilitation of RCEP member states is improved, China's cross-border e-commerce exports to them will also increase simultaneously.

1. Introduction

The Covid-19 epidemic has had a profound impact on the global economic system. Against the backdrop of rising trade protectionism and unilateral forces, RCEP, as the largest free trade agreement in the world economy, has injected vitality into the development of China's trade and investment. With the emergence of digital technologies such as big data, digital twin, knowledge graph, RPA and AI, the forms of commodities and trade are also inevitably undergoing profound digital changes. For example, cross-border e-commerce, as the in-depth application of Internet technology in the field of international trade, has gradually become an important driving force for the transformation of old and new driving forces in China's foreign trade [2]. It is also a new engine for foreign trade growth.

With the full entry into force of RCEP, digital trade among member states has developed rapidly, especially cross-border e-commerce. In the RCEP agreement, e-commerce as an independent chapter, on the one hand, the chapter proposes paperless trade, electronic authentication and other forms to enhance trade facilitation. On the other hand, while promoting the cross-border flow of electronic information, the chapter enhances online consumer protection, ensures the security of personal and commercial electronic information, and only carries out necessary supervision on e-commerce to the maximum extent. The RCEP has created a more open and secure environment for digital trade among member states and is a strong backing for countries in the region to develop cross-border e-commerce.

Based on the above background, this paper comprehensively evaluates the degree of digital trade

facilitation in the 15 member countries of RCEP through multiple indicators, discusses the specific impact on China's cross-border e-commerce exports, and proposes corresponding strategies to promote the development of digital trade between China and RCEP member countries.

2. Definition and measurement of digital trade

2.1 Definition of digital trade

As a new form of trade, the relevant research on digital trade has just started, and the definition of digital trade has not been unified and standardized at present. However, scholars have a consensus that digital trade is the application of modern digital technology in the field of trade. In 2023, the World Trade Organization (WTO), the International Monetary Fund (IMF), and the Organization for Economic Cooperation and Development (OECD) jointly published the Handbook on Measuring Digital Trade (Second edition), which gives a broad definition of digital trade, all trade through digital subscription and delivery is digital trade.

2.2 Measurement of digital trade

In the past, scholars paid more attention to the measurement of traditional trade and its impact on international trade, such as the impact of customs clearance time and the policy transparency of trading partners on cross-border e-commerce. ^[1]Safaeimanesh and Jenkins (2020) took West African countries as research objects and studied the impact of the number of documents and customs clearance time required for cross-border trade customs on the welfare effect of economic communities. The research results found that reducing trade compliance costs could bring welfare benefits of 1.6 billion to 2.7 billion yuan per year.

Table 1: Digital trade facilitation level measurement indicators and data sources

Primary indicators	Secondary indicators	Data sources
Digital trade potential	Gross domestic product(GDP)	World Bank
	Total import and export trade	
	Domestic consumption expenditure	
	Adjusted net national income per capita (current US \$)	
Digital consumption demand	Number of Internet users	
Digital trade structure	Information and communication technology imports as a percentage of the total	United Nations Conference on Trade and Development
	Information and communication technology exports accounted for the total	
	Total imports of information and technology products (current US \$)	
	Total exports of information and technology products (current US \$)	
Digital trade environment	Mobile Internet penetration	International Telecommunication Union
	Fixed broadband penetration	
		Secure Internet servers (per million people)

As a new type of trade activity, there are relatively few researches on digital trade measurement. ^[2]Fayyaz and Saeed (2019) measure digital trade and e-commerce in Iran based on the conceptual framework of the Organization for Economic Cooperation and Development (OECD), and the results show that e-commerce has become a major part of Iran's economic growth. In 2023, the Manual of Digital Trade Measurement (2nd Edition) only systematically shows the research results of OECD and other international organizations on digital trade measurement, but does not give

specific measurement methods and processes. However, the report's recommendations on the measurement of digitally ordered trade and digitally delivered trade have important guiding significance for this paper.

Based on the measurement method of scholars on the level of digital trade facilitation, this paper constructs the measurement method as shown in Table 1, and calculates the value of digital trade facilitation level of 15 RCEP countries through entropy method, the result as Table 2 shown.

Table 2: RCEP countries' digital trade facilitation levels from 2012 to 2021

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
China	0.29	0.32	0.35	0.37	0.38	0.43	0.51	0.54	0.56	0.66
Singapore	0.26	0.27	0.30	0.28	0.32	0.40	0.44	0.50	0.54	0.47
Japan	0.26	0.25	0.27	0.26	0.28	0.29	0.31	0.34	0.36	0.36
Korea	0.19	0.20	0.21	0.21	0.22	0.23	0.25	0.25	0.27	0.29
Australia	0.20	0.21	0.20	0.20	0.20	0.22	0.25	0.26	0.26	0.27
New Zealand	0.14	0.15	0.15	0.15	0.16	0.18	0.18	0.19	0.19	0.18
Malaysia	0.14	0.14	0.15	0.15	0.15	0.16	0.16	0.17	0.18	0.18
Vietnam	0.08	0.10	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17
Philippines	0.11	0.10	0.11	0.13	0.13	0.12	0.13	0.15	0.16	0.16
Brunei	0.10	0.11	0.11	0.11	0.11	0.12	0.12	0.14	0.15	0.14
Thailand	0.09	0.09	0.10	0.10	0.10	0.11	0.11	0.12	0.13	0.13
Indonesia	0.05	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.08	0.09
Burma	0.01	0.02	0.02	0.03	0.03	0.03	0.03	0.04	0.04	0.04
Laos	0.02	0.02	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Cambodia	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03

3. Empirical research

3.1 Experimental method and process

In the 1960s, Tinbergen introduced the gravity model into the field of international trade research to study the relationship between trade volume, GDP and geographical distance. Through a large number of research data, he found that the total trade volume between two countries is proportional to GDP, while the geographical distance is inversely proportional, that is, the trade volume between two countries increases with the growth of GDP. In theory, the less trade they do.

Based on this theory, this paper introduces national population (POP), distance between two countries (DIS), per capita gross national product (GDP) and economic freedom (TAX) as control variables, and finally sets the model of this paper as follows:

$$\ln EXP_{ijt} = \alpha_0 + \alpha_1 \ln POP_{jt} + \alpha_2 \ln GDP_{jt} + \alpha_3 \ln Dis_{ij} + \alpha_4 \ln TAX_{jt} + \varepsilon_{jt} \quad (1)$$

EXP means China's cross-border e-commerce exports to RCEP member states. DIG means level of digital trade facilitation in RCEP member countries. POP is the domestic population of each RCEP member reflects the number of potential target customers. DIS is Geographical distance between China and RCEP member countries. GDP reflects the country's trade needs, TAX reflecting the country's degree of marketization. All the data source is World Bank.

3.2 Experimental result

Using Stata 17.0 software, through regression analysis, the following conclusions can be drawn.

The level of digital trade facilitation (lnDIG) of RCEP member states has a positive impact on China's cross-border e-commerce exports. The regression coefficient is positive, and the empirical

results prove that the improvement of digital trade facilitation in the target countries of cross-border e-commerce exports is conducive to expanding the scale of cross-border e-commerce exports. From the perspective of fixed effects, the level of digital trade facilitation is significant at 1%. When other conditions are the same, the level of digital trade facilitation in RCEP member countries is increased by 1%. China's cross-border e-commerce exports will expand by 0.6606%.

The total population of RCEP member states (InPOP) has a positive impact on China's cross-border e-commerce exports. The regression coefficient is positive. From the perspective of fixed effect, the national population at 1% level is significant, indicating that when other conditions are the same, every 1% increase in the population of the target exporting country, the scale of China's cross-border e-commerce exports to it will increase by 3.0743%. As the population of a country increases, consumer demand will increase simultaneously, and the demand for cross-border e-commerce will also increase, which will strongly promote the expansion of the scale of cross-border e-commerce.

The geographical distance between China and RCEP member countries (InDIS) has a negative impact on China's cross-border e-commerce exports. Its regression coefficient is -2.1446, which is significant at the 1% level, indicating that when other conditions are the same, when the geographical distance between China and the target member countries increases by 1 unit, the scale of China's cross-border e-commerce exports to them will decrease by 2.1446 units. The greater the geographical distance between the two countries, the higher the cost of trade, and the less China's cross-border e-commerce exports to the country. With the progress of logistics infrastructure and the gradual establishment of overseas warehouses, the impact of geographical distance on cross-border e-commerce exports is gradually weakening.

The economic freedom (InTAX) between China and RCEP member states has a positive impact on China's cross-border e-commerce exports, and the regression coefficient is positive. From the perspective of fixed effect, the level of economic freedom is significant at 1%, indicating that when other conditions are the same, every 1% increase in economic freedom will increase the scale of China's cross-border e-commerce exports to other countries by 2.1940%.

Continuing the empirical study on the four first-level indicators of digital trade facilitation, it can be concluded that the regression coefficients of the four first-level indicators are all greater than 0, indicating that they have a positive impact on China's cross-border e-commerce exports. Among them, the regression coefficient of digital trade potential (InDIG1) is 0.8961, which is significant at the level of 1%, that is, every 1% increase in the digital trade potential of RCEP member states, the scale of China's cross-border e-commerce exports to it will increase by 0.8961%, which is the most significant among the four first-level indicators.

Considering that the income level of different countries is different and the difference is large, which may have a certain impact on the empirical results, this paper further conducts heterogeneity analysis to study the impact of individual differences on the dependent variables, that is, the impact of individual differences on China's cross-border e-commerce exports. In 2021, the World Bank defines countries with per capita national income of more than 12,695 US dollars as high income. According to this classification standard, RCEP member countries are divided into two groups of high income and non-high income research objects. Six high-income countries are Japan, South Korea, Australia, Singapore, New Zealand and Brunei, while eight non-high-income countries are the Philippines, Cambodia, Malaysia, Myanmar, Thailand, Vietnam, India and Indonesia.

The promotion of economic freedom in non-high income RCEP countries has an obvious role in promoting China's cross-border e-commerce exports, compared with higher income countries. This is mainly due to the fact that the economic freedom of higher income countries has been perfected, while the economic freedom of non-high income countries still has a large room for improvement, so the effect on cross-border e-commerce is weaker than that of non-high income countries.

4. Conclusion

This paper takes RCEP countries as the research object. First of all, by combing and summarizing the existing research results on digital trade and cross-border e-commerce, the development status of digital trade in RCEP member states is presented, and the impact mechanism of digital trade facilitation on the scale of China's cross-border e-commerce exports is explored. Secondly, on the basis of previous studies, from the four dimensions of digital trade potential, digital consumption demand, digital trade structure and digital trade environment, 12 secondary indicators are constructed to form a digital trade facilitation level evaluation system and measure the digital trade facilitation level of 15 RCEP countries. The higher the overall score is, the higher the level of digital facilitation it is.

The results show that the overall level of digital trade facilitation in 15 RCEP member states from 2012 to 2021 is on the rise, and the five RCEP countries with the highest level of digital trade facilitation in the decade have always been China, Singapore, Japan, South Korea, and Australia. Among them, the fastest growing countries in the level of digital trade facilitation are China and Singapore, and the slower growing countries are Laos, Myanmar and Cambodia. The overall level of China's digital trade facilitation is on the rise, and the growth rate is fast, and in 2021, China will become the country with the highest comprehensive score of digital trade facilitation. China has strong digital trade potential and digital trade demand, but the digital trade environment score is low and the growth rate is slow, indicating that China's digital trade environment still has a large room for optimization. In particular, the number of secure Internet servers per million people in China is significantly lower than that in developed countries, which still needs to be optimized and improved, and it is necessary to make full use of the existing foundation and vigorously promote the construction of digital trade facilitation from various aspects.

On the basis of the calculated results, the trade gravity model is used for empirical analysis, with China's cross-border e-commerce exports to RCEP member states as the explained variable and digital trade facilitation as the core explanatory variable. Other explanatory variables are the domestic population of RCEP member states, the geographical distance between China and RCEP member states, the per capita GDP of each country, and the degree of economic freedom. Through empirical analysis, the impact of digital trade facilitation on the scale of cross-border e-commerce exports in China is analyzed. The empirical results show that the digital trade facilitation level of RCEP countries has a positive impact on the scale of China's cross-border e-commerce exports to some extent. When other conditions remain unchanged, when the digital trade facilitation level of RCEP countries increases by 1 unit, China's cross-border e-commerce exports increase by 0.7166 units. Among them, the primary indicator with the greatest impact is digital trade potential. In addition, the improvement of digital trade facilitation in higher income countries has a more significant role in promoting the scale of China's cross-border e-commerce exports than that in non-higher income countries.

References

- [1] Safaeimanesh S, Jenkins G P. *Trade Facilitation and Its Impacts on the Economic Welfare and Sustainable Development of the ECOWAS Region*[J]. *Sustainability*, 2020, 13(1): 164.
- [2] Fayyaz S. *A Review on Measuring Digital Trade & E-Commerce as New Economic Statistics Products* [J]. *Statistika: Statistics & Economy Journal*, 2019, 99(1).