

# The Influence of RTA Digital Terms on Exports of Digital Trade Sector: An Empirical Analysis Based on RCEP Member States

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**Abstract:** The development of digital technologies such as blockchain and the increase in ICT popularity have caused the rapid development of the digital service trade sector; meanwhile, in this context that the WTO cannot coordinate digital rule negotiations among various countries at the global level, the signing of RTA with digital terms has also built up to a small climax. This paper selects 24 samples of RTA implemented among RCEP member states from 2012 to 2019, empirically tests the influence of digital terms in RTA on digital trade exports, suggests that various countries pay more attention to the breadth and depth of terms in the negotiation process of RTA digital terms, further promote the digital free flow and digital technology protection, and support the high-quality development of digital trade.

**Keywords:** RTA, Digital term, Digital trade, Trade export, RCEP.

## 1. Introduction

In recent years, with the improvement of internet infrastructure and the increase in ICT popularity, the digital economy has gradually become a hot topic in the field of economic research, as an important growth point in the field of international trade in the digital economy era, digital trade has played an important role in promoting the development of world economy and trade, and the adjustment of international trade structure, the digital trade this paper refers to is the trade flow of knowledge intensive and digital service sectors.

According to the Aid for Trade in Asia and the Pacific issued by the WTO, by 2025, the accelerated digital transformation will increase the size of the digital sector by 20% than 2020; the trade in digital delivery services in the Asia-Pacific region has expanded from \$403.4 billion in 2005 to \$1.4 trillion in 2019, it is expected that Asia will receive over \$1.7 trillion in economic dividends every year from 2020 to 2025, and continue to rise as a major player in the global digital platform market.

More digitization means more trade. In the context of the prosperity and development of the digital economy, countries around the world are taking and creating diversified measures to improve the digitization level to support the development of digital trade, including widely used "trade facilitation" technologies such as blockchain, "trade facilitation measures" such as digital single windows and electronic signatures, and trade agreement terms containing digital agreements. According to the above WTO report, from 2019 to 2021, tools such as paperless trade increased by about 6%; from 2000 to 2020, 188 out of 353 trade agreements filed in international organizations included digital clauses, accounting for 53% of the total number of agreements.

Faced with recent research hotspots, governments around the world invested a large amount of resources to support the development of the digital economy and trade, and the signing of RTA containing digital terms also built up to a small climax. But can RTA digital terms have a positive effect on the volume of digital trade? How much positive effect can it

have? Is the effect of different types of digital terms heterogeneous? This paper mainly answers these questions.

## 2. Literature Review

At present, academic community has a lot of research on RTA digital terms and digital trade,

the research scope mainly selects member states of international organizations such as APEC and OECD; however, empirical research on whether RTA digital terms will have a practical effect on digital trade is still relatively scarce.

### 2.1. Research on the influence of various digital rules on digital trade

For now, most of the studies on the influence of digital trade start from digital rules, for various countries' numerical rules, this paper analyzes the breadth and depth of the digital rules of various countries quantitatively, studies the influence of different rules on digital trade. Based on the traditional gravity model, Zhao Jingyuan et al.[2] This paper analyzed the domestic value added of exports in the digital sector for 42 economies from 2000 to 2014, concluded that the unification of digital rules is beneficial to the promotion of digital trade, among which the depth of the data-related terms has the greatest promotion effect. Based on the OECD empirical data from 2010 to 2017, Chen Huanqi[3] quantitatively analyzed the depth of free flow of cross-border data, found that as the commitment level of "free flow of cross-border data" increased, the rule will have a stronger effect on the promotion of digital trade. Based on the static panel gravity model, Zhou Nianli and Chen Huanqi[4] used the service trade data of OECD from 2010 to 2018, and concluded that the American rules can significantly promote the development of bilateral digital trade, among which the free flow of cross-border data, non-compulsory storage of data, and the protection of source code rules play a more significant role in promoting the development of bilateral digital trade.

## 2.2. Research on the influence of RTA digital terms on economic and trade

Based on three biggest trade agreements: Transatlantic Trade and Investment Partnership (TTIP), Trade in Services Agreement (TISA) and Trans-Pacific Partnership (TPP), Li Mosi[5] investigated that the deepening RTA digital terms effectively promote the development of the digital economy in Europe, the United States and other economies. Sun Yuhong et al.[6] screened 59 RTA among APEC countries that contain digital terms, analyzed the depth and breadth of the digital terms, and concluded that the digital terms of RTAs can effectively promote the development of trade in services. The above research shows that the digital terms of RTA have an important influence on the development of national economy and the improvement of international trade in the current environment.

Most of the existing researches are based on specific digital trade rules, and most of the influenced objects explored are more macroscopic economic and trade indexes, there is not much research on the influence of digital terms in RTA on the export volume of digital trade sector. This paper focuses on studying the more detailed digital trade volume, selects 15 member states of RCEP as the research objects, analyzes the changes in the export volume of digital trade among member states caused by the signing of RTA digital states between 2012 and 2019, explores whether there is a significant positive influence of the signing of the RTA digital terms on the digital trade export volume.

## 3. Research Design

### 3.1. Research hypothesis

The terms related to digital trade in the RTA may contribute to the growth of export flows in digital trade among the contracting parties, namely growth of export flow in the knowledge-intensive services trade sector. On the one hand, the digital terms in the RTA may make request on the regulations of the contracting parties, impels the contracting parties to improve or redesign their system environment in digital trade or knowledge-intensive services sectors; on the other hand, terms in the RTA that promote cooperation among contracting parties in digital trade may also promote technology exchange among contracting parties, and thus enhance the hardware and software level of the relevant trade sectors of the contracting parties. In addition, the various types of digital provisions in the RTA may be heterogeneous and have different impacts on the export volume of digital trade, for example, terms on intellectual property protection or data protection may inhibit the growth of exports in the relevant sectors. Previous studies have shown that digital terms in the RTA have a universality in promotion effect of service trade, but differences in the strength and different types of digital terms may have different effects on service trade[7], so the following hypotheses are made.

Hypothesis 1: digital terms in the RTA will promote the growth of export volumes in digital trade among the contracting parties.

Hypothesis 2: the higher the strength of the numerical terms in the RTA, the stronger the promotion effect of the growth of the export volumes of digital trade among the contracting parties.

Hypothesis 3: the influence of various types of digital terms in the RTA on the export volumes of digital trade is different.

## 3.2. Model setting

Combining the core explanatory variables and the relevant factors that may affect the export volumes of digital trade, the model used in research is:

$$\ln(\text{trade})_{ijt} = F_0 + F_1 \text{rtai}_{jt} + F_2 \text{control}_{ijt} + e_{ij} + e_{it} + e_{jt} + \varepsilon_{ijt}$$

Subscript  $i$  denotes the country of the exporter,  $j$  denotes the country of the importer, and  $t$  denotes the year.  $\ln(\text{trade})_{ijt}$  is the export volumes of digital trade of explanatory variable introduced above,  $\text{Ttai}_{jt}$  is the core explanatory variable of the digital terms, etc.,  $\text{contTol}_{ijt}$  is the set of control variables,  $e_{ij}$  denotes the fixed effects between importing and exporting countries,  $e_{it}$  denotes the time fixed effects of exporting countries,  $e_{jt}$  denotes the time fixed effects of importing countries, and  $\varepsilon_{ijt}$  denotes the residual term.

## 3.3. Main variables

### 3.3.1. Explanatory variables

The explanatory variables are the export volumes of digital trade among the member states involved in RCEP in 2012-2019. According to the general practice of the study, the export volumes of digital trade is defined as the trade service sector of that can make full use of digital technology, namely the sum of the export volumes of insurance and pension services, financial services, telecommunication computer and information services, intellectual property fees, other business services, and personal and cultural and recreational services in the EBOPS project developed by the WTO in 2010, logarithmic processing is required in the study. Export flows are counted in millions of dollars. Data comes from [stats.wto.org](http://stats.wto.org).

### 3.3.2. Core explanatory variables

The core explanatory variables all originate from the TAPED database of the University of Lucerne, Switzerland, this database includes all RTA containing numerical terms and rates each specific numerical term. The core explanatory variables of this paper, numerical terms  $\text{Ttai}_{jt}$  in RTA, containing two baseline variables,  $\text{Tta}$  (denote whether there is a RTA between countries  $i$  and  $j$  in year  $t$ , 1 is yes and 0 is no.),  $\text{sum}$  (denotes the intensity score of RTA implemented between countries  $i$  and  $j$  in year  $t$ , it is obtained by dividing the score of each term by the total number of terms.), and four heterogeneous categorical variable:  $\text{es}$  (intensity of e-commerce terms),  $\text{ds}$  (intensity of data flow terms),  $\text{ss}$  (intensity of service trade terms),  $\text{is}$  (intensity of intellectual property terms), these four categorical variable are also obtained by dividing score summation of each term of the category by the total number of such terms.

### 3.3.3. Control variables

Control variables include:

(1) Goods trade volume between countries  $\text{gtTade}$ , generally the larger the good trade volume between the two countries, it suggests that the two countries have a higher degree of economic openness, the closer the economic ties between the two countries, and the larger the export volumes of their digital trade.

(2) The total size of the economy of the importing and exporting countries ( $\text{SUMGDP}$ ), it is obtained by summing the GDP of importing and exporting countries and then taking the logarithm. Generally, for open countries, the larger the economy of a country is, the larger its export trade volume is, accordingly, the signing of RTA that includes digital trade terms also has a greater impact on the export volume of digital trade.

(3) The similarity of the economies of importing and exporting countries (SIMGDP), IT is obtained by multiplying the proportion of the respective GDP of importing and exporting countries to the total GDP of both sides and taking the logarithm. The higher the similarity between the

economies of importing and exporting countries, the greater the frequency and scale of bilateral trade, and the greater the export scale of digital trade. The descriptive statistics results of the explanatory variables, core explanatory variables and control variables in this paper are shown in Table.1.

**Table 1.** Descriptive statistics result of variables

variable name	sample size	mean value	standard deviation	minimum	maximum
tTade	1678	458.925	1226.685	0	13847.211
Tta	1678	.837	.369	0	1
sum	1678	.653	.421	0	1.844
es	1678	.69	.463	0	1.95
ds	1678	.509	.35	0	.75
ss	1678	1.13	.68	0	3
is	1678	.49	.327	0	1.682
gtTade	1678	1.978	4.429	0	33.269
SUMGDP	1678	27.819	1.443	23.912	30.596
SIMGDP	1678	.113	.086	.001	.25

## 4. Empirical Analysis

### 4.1. Benchmark regression results

**Table 2.** Influence of terms in RTA related to digital trade on export flows of digital trade among contracting parties

	(1) trade	(2) trade
rtA	0.116*** (0.043)	
sum		0.097*** (0.037)
gtrade	0.038*** (0.007)	0.040*** (0.007)
SUMGDP	omitted	omitted
SIMGDP	0.714 (0.623)	0.406 (0.595)
cons	7.164*** (0.090)	7.219*** (0.085)
observations	1678	1678
R <sup>2</sup>	0.995	0.995

Note: standard deviations are in parentheses, \*\*\*, \*\*, \* denote significance levels of 1%, 5% and 10%, respectively.

The results suggest that if the RTA contains digital trade terms, it has a significant positive effect on the export volumes of digital trade, which will make the export volumes of digital trade increase by 11.6%, and hypothesis 1 is verified. The coefficient of RTA intensity is significantly positive, it suggests that the greater the intensity of RTA, the greater the promotion effect on the export volumes of digital trade, specifically, every one unit is increased in intensity, the export volumes of digital trade will increase by 9.7%. Hypothesis 2 is tested.

### 4.2. Robustness test

The sample time period selected in this paper is 2012~2019, in order to exclude the particularity of the selected time period, as a result, the results are only applied to this dataset, when time changes, it produces different results than expected, this paper expands the sample time period and uses data from sample countries from 2007 to 2019 for testing. The results are shown in Table.3.

**Table 3.** Robustness test

	(1) trade	(2) trade
rta	0.100*** (0.033)	
sum		0.0091*** (0.029)
gtrade	0.021*** (0.006)	0.022*** (0.005)
SUMGDP	-0.536*** (0.190)	-0.511*** (0.190)
SIMGDP	-0.132 (0.569)	-0.215 (0.563)
cons	22.991*** (5.594)	22.268*** (5.615)
observations	2278	2278
R <sup>2</sup>	0.994	0.994

Note: standard deviations are in parentheses, \*\*\*, \*\*, \* denotes significance levels of 1%, 5%, and 10%, respectively.

## 5. Heterogeneity Analysis

**Table 4.** Heterogeneity analysis of the influence of different digital trade terms in RTA on the export volumes of digital trade

	(1) trade	(2) trade	(3) trade	(4) trade
es	0.099*** (0.036)			
ds		0.167*** (0.058)		
ss			0.057** (0.024)	
is				0.069** (0.032)
gtrade	0.040*** (0.007)	0.037*** (0.007)	0.040*** (0.007)	0.043*** (0.007)
SUMGDP	0.489 (0.601)	0.742 (0.621)	0.432 (0.599)	0.156 (0.590)
cons	7.210*** (0.086)	7.190*** (0.087)	7.199*** (0.087)	7.248*** (0.085)
observations	1678	1677	1678	1678
R <sup>2</sup>	0.995	0.995	0.995	0.995

Note: standard deviations are in parentheses, \*\*\*, \*\*, \* denote significance levels of 1%, 5% and 10% respectively.

According to the regression results of heterogeneity analysis in Table.4, the influence of different contents of digital trade terms on the export volumes of digital trade does vary, and hypothesis 3 is verified. Data flow terms have the strongest promotion effect on export volumes of digital trade, and the scale effect brought by the free flow of data can reduce the marginal cost of collecting and analyzing mass data, and promote the development of digital trade.

## 6. Conclusion

By conducting the empirical analysis of digital trade terms in RTA above, the following three conclusions are drawn for the Asia-Pacific region in the past decade: first, digital term in RTA can have a significant promotion effect on export

volumes of digital trade among contracting parties; second, the higher the strength of digital terms in RTA, the stronger the promotion effect of export volumes of digital trade among contracting parties; third, the types of digital terms in RTA can affect the promotion effect of export volumes of digital trade among contracting parties, among which the data flow type of provisions having the strongest effect on the promotion of digital trade exports. Third, data flow terms have the strongest promotion effect on the export volumes of digital trade, the data flow terms have the strongest promotion effect on the export volumes of digital trade. The conclusion shows that Broader and deeper digital trade provisions have a more significant promotion effect to the export volumes of digital trade, which is more conducive to the growth of export

flow in the country's knowledge-intensive service trade sector, thus promoting the development of the country's digital trade and increasing the impetus for the country's digital economy.

In a sign of the times, any attempt to build and strengthen regional cooperation systems, such as the RCEP, should support a free market of global data flow, reduce radical interventionism and trade protectionism tendencies, and explore the breadth and depth of the digital terms in RTA to better realize the expected positive influence of the RTA digital terms on digital trade among countries. In addition, for widespread signing of RTA digital terms in Asia, the positive impact of RTA digital terms on the export volumes of digital trade is conducive to narrow the expected growth gap between many developing and developed countries in digital trade, ultimately, this will promote global upgrading of transnational mobility and of development dynamics.

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