

The Impact of Competition Policy Provisions in Regional Trade Agreements on Intermediate Product Trade

Yixin Yang^{1,*}, Zejjong Zhou²

¹School of International Trade and Economics, Anhui University of Finance and Economics, Bengbu, Anhui, China

²School of Economics, Anhui University of Finance and Economics, Bengbu, Anhui, China

*Corresponding author: ymax1219@foxmail.com

Abstract: The deepening of the content of regional trade agreements has promoted the deep integration of global value chains. As an important part of the behind-the-border measures of regional trade agreements, competition policy provisions have an important impact on intermediate product trade. This paper constructs the depth index of competition policy provisions, uses the trade gravity model combined with Poisson's pseudo maximum likelihood estimation (PPML) and fixed effects to empirically analyze the impact of competition policy depth on the scale of intermediate product trade, and finally proposes policy recommendations for China to improve the construction level of regional trade agreements according to the conclusions.

Keywords: Regional trade agreements, Gravity model, Competition policy, Intermediate product trade.

1. Introduction

Regional economic integration has become a major trend of international economic and trade development. As an important carrier of regional economic integration, the regional trade agreement (RTA) has grown rapidly in number while its content has also deepened. More and more agreements have been incorporated into "behind-the-border" measures such as competition policy. Under the framework of competition policy, countries carry out domestic system reform, seek production cooperation, and accelerate the flow of transnational capital, which will promote the deep integration of global value chain and drive the value chain trade characterized by intermediate products. The importance of competition policy is increasingly prominent. Therefore, it is of great significance to focus on the competition policy in RTAs and explore its impact on the trade effect of intermediate products of contracting countries.

2. Literature Review

2.1. Research on the heterogeneity of trade agreement terms

Because trade agreements signed by countries with different levels of economic development are different in terms of content rather than homogeneity, scholars began to study the heterogeneity of trade agreement terms. Horn et al. (2010) [1], based on the concept of "depth" of trade agreements first proposed by Lawrence (1996) [2], divided trade terms into "WTO+" and "WTO-X" (competition policy is included in "WTO-X"), and creatively measured the depth and legal binding force of terms. Kohl et al. (2016) [3], Hofmann et al. (2017) [4] and others also expanded on this basis. At present, Mattoo et al. (2020) [5] has carried out quantitative research on the heterogeneity of competition policy provisions for the first time. They examined the competition policy provisions in 284 trade agreements (including the competition policy chapter and the competition provisions that exist outside the competition chapter), and

divided them into two dimensions: the economy-wide obligations and the sector-specific obligations. They also measured the level of enforceability of the competition provisions in each agreement by assigning scores.

2.2. Research on the impact of trade agreements on intermediate product trade

Most of the existing studies study the effect of trade agreements on total trade volume from the overall perspective, and a small number of literature studies its impact on intermediate trade. Orefice and Rocha (2014) [6] Based on 66 RTAs signed by European and American countries, the study found that the deepening of trade agreements can significantly promote the scale of intermediate trade. Gao Jiang and Sheng Bin (2018) [7], from the perspective of global production networks, found that the depth of trade agreements has a greater role in promoting value chain trade than traditional trade. Xu Yayun et al. (2020) [8], using the gravity model of the "single country model", found that the signing of RTA significantly promoted the trade of intermediate products between China and 60 trading partners, and the deeper the content of the agreement, the greater its role in promoting trade among members.

To sum up, a small amount of literature examines its impact on intermediate trade based on the overall perspective of trade agreements, and only takes competition policy as a sub clause of "WTO-X", without carrying out targeted analysis. Based on this, this paper takes the competition policy of trade agreements as the research subject to explore its impact on the trade of intermediate products of contracting countries.

3. Analysis of Competition Policy Provisions in Regional Trade Agreements

3.1. Analysis on content characteristics of competition policy

Since 2004, the competition policy chapter has been incorporated into many regional trade agreements, and the

reconstruction of international competition rules has also been carried out rapidly. The competition policy of regional trade agreements has been continuously developed and improved in breadth and depth. The competition policy of regional trade agreements plays a role in maintaining the market competition environment, ensuring the realization of the objectives of trade agreements, and promoting international cooperation in competition policy. [10]

Based on the competition policy database built by Mattoo et al. (2020), this paper focuses on the economy-wide obligations. The economy-wide obligations can be divided into four aspects, namely, the overall goal (such as whether there are provisions to promote cooperation related to competition among members), horizontal commitment (such as whether there are provisions on transparency, non-discrimination and procedural fairness), specific competition policies (such as whether to require the establishment of a competition authority, whether to supervise monopoly behavior, etc.) and general exceptions (such as whether the competition policy contains general exceptions, security exceptions, and other exceptions). The economy-wide obligations are subdivided into 35 issues.

3.2. Analysis of quantitative characteristics of competition policy

In the RTAs signed in the competition policy database from 1958 to 2016, more than four fifths (239 out of 285 samples) contain provisions related to competition, and competition policy has gradually become an indispensable part of the signing of trade agreements. As the most dynamic region in the global economy, the Asia Pacific region is also an important engine of world economic growth. Deepening economic integration in the Asia Pacific region and promoting trade and investment liberalization and facilitation have also been the common aspiration and goal of the Asia Pacific economies for a long time. This paper collates the number of RTAs signed by 31 sample Asia Pacific economies and the number of RTAs containing competition provisions, as shown in Table 1. According to the statistics of the agreement information in the database, there are 125 agreements with competition policies in 158 RTAs that 31 Asia Pacific economies have participated in. Among them, 21 agreements signed by Chile contain competition policy provisions, ranking first among 31 Asia Pacific economies. In the database, 10 of the 15 in-force RTAs that China has signed contain competition provisions, such as China--South Korea, China--Switzerland and China--Iceland trade agreements.

Table 1. The number of in-force RTAs that the Asia Pacific economies participate in and the number of RTAs that contain competition provisions

Developed economies			Developing economies					
Countries (regions)	RTAs number	Number of RTAs with competition provisions	Countries (regions)	RTAs number	Number of RTAs with competition provisions	Countries (regions)	RTAs number	Number of RTAs with competition provisions
Canada	12	12	Thailand	11	4	Mexico	15	13
America	14	9	Malaysia	13	4	Colombia	13	10
Australia	13	11	Philippines	8	2	Peru	16	14
Japan	16	14	Vietnam	11	4	Chile	26	21
South Korea	18	16	Brunei	8	2	Uruguay	4	3
New Zealand	12	11	Indonesia	8	2	Panama	16	15
Singapore	23	14	China	15	10	Costa Rica	13	13
			Hongkong, China	4	3	Honduras	10	10
			Chinese Taipei	6	6	Dominican Republic	4	3
			India	17	10	El Salvador	10	9
			Pakistan	9	6	Guatemala	9	9
			Sri Lanka	8	6	Nicaragua	9	8

Note: Trade agreements involving two or more countries (regions) are counted many times.

Source: The author collates the data from the World Bank's competition policy database updated in June 2022.

3.3. Analysis of in-depth characteristics of competition policy

Based on the latest competition policy database created by Mattoo et al. (2020), this paper constructs two main evaluation indicators. The first is the depth of the issue of competition provisions in trade agreements. The progressiveness of the 35 issues set according to the economy-wide obligations of competition policy compared with the current WTO negotiation framework and rules is divided into four levels, with 0-3 points respectively. The depth scores of the 35 issues are summed up and averaged. It

is recorded as "wtodepth", and the value range is [0,3]. The second is the binding depth of competition provisions. The economy-wide obligations are subdivided into 35 issues, and each issue will be measured by the legal binding force of the provisions. From whether binding to whether there is a dispute settlement mechanism, there are six dimensions, with 0-5 points assigned from the lowest to the highest. The legal binding force scores of 35 issues are summed up and averaged. It is recorded as "enforcedepth", and the value range is [0,5].

This paper selects 95 RTAs containing competition provisions signed among 31 economies in the Asia Pacific region in the competition policy database from 1998 to 2016,

calculates the scores of the issue depth and binding force depth of competition provisions, and divides the agreements by score, as shown in Table 2. It can be seen from this that most RTAs in the Asia Pacific region are in low segments, regardless of the depth of issues or the depth of binding force. Therefore, economies in the Asia Pacific region, especially

developing economies, should actively sign high-level trade agreements with other countries, emphasize the signing of competition policy related provisions, promote the in-depth development of clause issues and enhance the legal enforcement of provisions.

Table 2. Scores of depth of issues and binding force of competition provisions and proportion of agreements

Score	Depth score of competition clause issues			Depth score of binding force of competition provisions				
	0-1.0	1.0-2.0	2.0-3.0	0-1.0	1.0-2.0	2.0-3.0	3.0-4.0	4.0-5.0
Percentage of agreements	41.05%	56.84%	2.11%	41.05%	57.89%	1.05%	0	0

4. Analysis of Trade in Intermediate Products in the Asia Pacific Region

The United Nations Broad Economic Categories (BEC) adopts a three digit coding structure, which can be summarized into intermediate goods, consumer goods and capital goods according to the end use. The intermediate goods are classified into the following eight categories: industrial primary food and beverages (111), industrial processed food and beverages (121), primary industrial supplies (21), processed industrial supplies (22), primary fuels and lubricants (31), fuel and lubricating oil processing products (322), capital product spare parts (42) and transport equipment spare parts (53). Add up the eight product categories to get the total trade volume of intermediate products. The data source is UN Comtrade.

4.1. Development status of trade scale of intermediate products

This paper selects 31 countries (regions) as representatives of the Asia Pacific region to study the current situation of goods trade in the Asia Pacific region and the role of intermediate goods trade in it. According to statistics, its total trade in goods in 2000 was 2411.1 billion US dollars, of which the trade in intermediate products was 1328.3 billion US dollars, accounting for 55.09%; By 2019, its total trade in goods was 709 billion US dollars, and the trade in intermediate products reached 415.44 billion US dollars, accounting for 58.60%. From 2000 to 2019, the trade in intermediate products was increased by 212.76%, surpassing the global overall level, and the trade in intermediate products always account for more than half of the total trade in goods in the Asia Pacific region. See Figure 1.



Figure 1. Trade volume of three categories of goods in the Asia Pacific region from 2000 to 2019 (unit: 10 billion US dollars)

Figure 2 shows the proportion of the trade in intermediate products of major countries in the Asia Pacific region in the global trade in intermediate products over the years. It can be seen from the figure that the trade volume of intermediate products of major countries in the Asia Pacific region always

accounts for more than 50% of the total trade volume of intermediate products in the world, which shows that the trade volume of intermediate products in the Asia Pacific region plays an important role in the world.

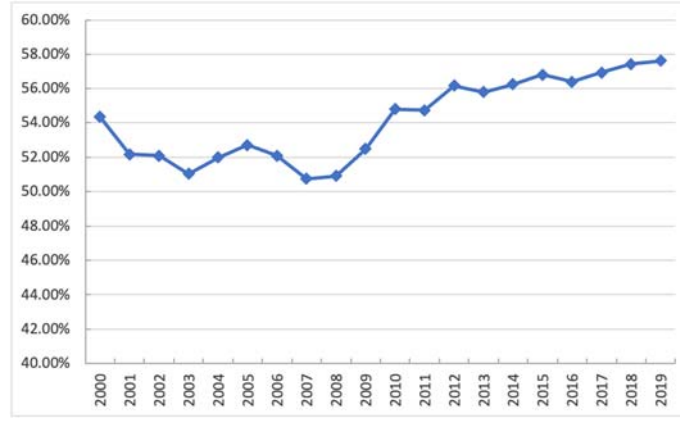


Figure 2. Proportion of trade in intermediate products of major economies in the Asia Pacific region in the global trade in intermediate products over the years, 2000-2019

4.2. Development status of intermediate product trade structure among major economies

We can also divide intermediate products into primary products (111, 21, 31), semi-finished products (121, 22, 322) and parts (42, 53) according to their processing level. See Figure 3 for the trade volume and trend of various intermediate products between countries in the Asia Pacific

region from 2000 to 2019 according to the degree of product processing. It can be seen from the figure that from the perspective of the Asia Pacific region, trade in primary products, semi-finished products and spare parts has shown an overall upward trend. Among them, the trade volume of semi-finished products accounts for a large proportion and the growth trend is obvious. The semi-finished products (processing products) are to gain profits, so as to further promote the domestic economic development.

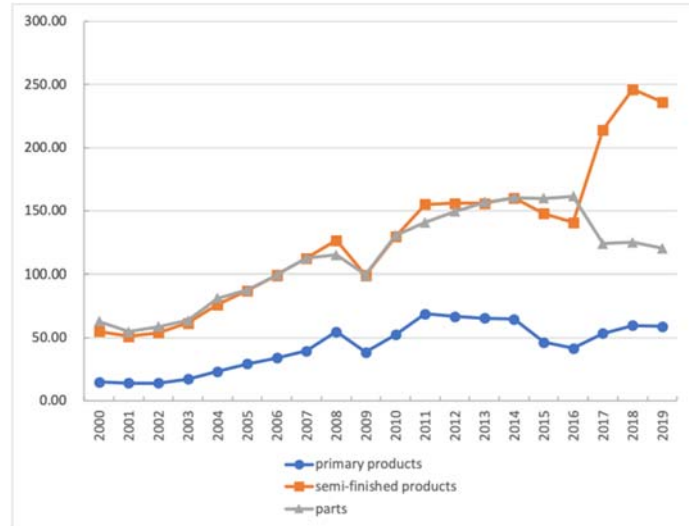


Figure 3. Trade volume of various intermediate products in the Asia Pacific region from 2000 to 2019 (unit: 10 billion US dollars)

5. Empirical Analysis of the Impact of Competition Policy on Intermediate Product Trade in RTAs

5.1. Model Setting and Data Description

This paper uses 110 in-force RTAs among 31 economies in the Asia Pacific region in the competition policy database released by the World Bank in 2020 as a sample, with a time interval of 2000-2019. Build the following benchmark measurement model:

$$\ln inter_{ij,t} = \beta_0 + \beta_1 cpdepth_{ij,t} + \beta_2 \ln distcap_{ij} + \beta_3 comcol_{ij} + \beta_4 comlang_off_{ij} + \beta_5 contig_{ij} + \gamma_{i,t} + \lambda_{j,t} + \varepsilon_{ij,t}$$

In the above formula, the interpreted variable $\ln inter_{ij,t}$ represents the trade volume of intermediate products imported by country i from country j in year t , and takes the

logarithm. The data are all CIF declared by the importing country and are from the UN Comtrade website. $cpdepth_{ij,t}$ is $cpdummy_i$, $wtodepth_i$ and $enforcedepth_i$. It is the core explanatory variable of this article, and can also be replaced by the dummy variable rta_dummy_i of whether the two countries have signed an agreement. $\gamma_{i,t}$ and $\lambda_{j,t}$ are respectively the exporter-year fixed effect and the importer-year fixed effect, which are used to control the characteristics of countries over time, such as the gross domestic product and price index of the importer and exporter. Relevant control variables (such as the geographical distance between the two capitals $distcap$, whether there is a common colonial relationship $comcol$, whether there is a common official language $comlang_off$, and whether there is a geographical proximity $contig$ are from the CEPII database. $\varepsilon_{ij,t}$ is the error term. Descriptive statistics of variables are shown in Table 3.

The empirical research results of Silver and Tenreyro (2006) [7] show that Poisson Pseudo Maximum Likelihood (PPML) can more effectively deal with the zero trade and

heteroscedasticity problems in the logarithmically linearized gravity equation and obtain consistent estimates. Therefore, this paper uses PPML method to estimate the above models.

Table 3. Descriptive statistics of variables

Variable	Sample size	Mean	SD	Min	Max
ln_interim	18013	18.048	3.579	0.693	26.157
rta_dummy	18013	0.433	0.495	0	1
cp_dummy	18013	0.21	0.407	0	1
wtodepth	18013	0.254	0.484	0	2.229
enforceddepth	18013	0.295	0.433	0	2.714
ln_distcap	18013	8.823	0.991	5.176	9.894
comcol	18013	0.048	0.213	0	1
comlang_off	18013	0.247	0.431	0	1
contig	18013	0.044	0.205	0	1

5.2. Analysis of regression results

Table 4 reports the regression results of the model. Virtual variable in model (1) rta_dummy's regression coefficient is significantly positive, and the elasticity is about 3.98%, that is, the signing of a regional trade agreement between two economies will increase the intermediate trade by about 3.98% on average. In model (2), Introduction of dummy variable cp_dummy, as a proxy variable for whether competition policy provisions are included in RTA, shows that competition policy provisions can significantly promote the trade of intermediate products among countries in the Asia Pacific region, and the average promotion effect is 3.77%.

Model (3) and (4) further investigate the extent to which the issue depth of competition policy provisions in RTA, wtodepth, and the depth of legal binding force, promote the trade of intermediate products. The results of model (3) show that the regression coefficient of wtodepth is significantly

positive, indicating that when using the term issue depth index to measure the heterogeneity of RTA in the content of competition policy, the implementation of RTAs has significantly increased the bilateral trade flow of intermediate products, and RTAs with deeper competition policy issues have a greater role in promoting trade, specifically, for each additional unit of term issue depth, it will increase the trade of intermediate products in Asia Pacific economies by 2.53% on average; The regression coefficient of terms' legal binding depth(enforceddepth) is significantly positive in model (4), which indicates that the legal binding depth of competition policy terms in RTA has a significant role in promoting intermediate product trade, and every additional unit of binding depth will increase bilateral trade volume by 3.67%, which further confirms that the dispute settlement mechanism is an important guarantee to ensure the smooth implementation of the agreement and promote the development of the global production network.

Table 4. Regression Estimation Results of RTA Dummy Variables and Indicators of Different Competition Policy Terms on Intermediate Product Trade

Variables	(1)	(2)	(3)	(4)
	ln interim	ln interim	ln interim	ln interim
rta_dummy	0.039*** (6.280)			
cp_dummy		0.037*** (5.510)		
wtodepth			0.025*** (4.192)	
enforceddepth				0.036*** (5.810)
ln_distcap	-0.070*** (-17.462)	-0.072*** (-17.706)	-0.074*** (-18.073)	-0.072*** (-17.837)
comcol	0.017 (0.893)	0.013 (0.665)	0.014 (0.701)	0.015 (0.779)
comlang_off	0.025*** (3.679)	0.023*** (3.481)	0.024*** (3.520)	0.023*** (3.457)
contig	-0.010 (-0.596)	-0.012 (-0.691)	-0.012 (-0.695)	-0.013 (-0.769)
Exporter-time FE	YES	YES	YES	YES
Importer-time FE	YES	YES	YES	YES
Country-pair FE	NO	NO	NO	NO
Observations	18,013	18,013	18,013	18,013
R-squared	0.826	0.825	0.824	0.825

Note: The values in () are t values. *, ** and *** represent significant at 10%, 5% and 1% levels respectively. Exporter-time FE, Importer-time FE and Country-pair FE represent whether the model

controls the exporter-year fixed effect, importer-year fixed effect and Country pair fixed effect respectively. Observation represents the number of samples and R-squared represents goodness of fit.

6. Conclusion

This paper makes a descriptive analysis of the competition policy provisions in the World Bank's competition policy database in 2020, and visually shows the development of intermediate product trade in major economies in the Asia Pacific region from 2000 to 2019. Finally, it makes use of co competition provisions in 110 in-force regional trade agreements among 31 economies in the Asia Pacific region in the database, The empirical test shows the impact of competition policy provisions in RTAs on bilateral trade in intermediate products. The conclusions are as follows: First, from 2000 to 2019, the growth rate of trade in intermediate products in the Asia Pacific region exceeded 200%, higher than the global overall level. Among them, the trade in processed intermediate products accounted for a large proportion and showed an obvious growth trend. In addition, the trade of intermediate products in the Asia Pacific region has always accounted for more than 50% of the total trade volume of intermediate products all over the world, which is in an important position in the world. Second, more and more regional trade agreements are now incorporating competition policies, but the scope and depth of competition policies in RTAs signed among economies in the Asia Pacific region need to be further developed and improved; Third, through empirical research and analysis, it can be seen that the competition policy provisions in RTA have a significant trade promotion effect on intermediate products, and the deeper the issue depth and legal binding force of competition policy provisions, the greater the promotion effect on intermediate product trade, thus promoting various economies to participate in the upgrading of global value chain.

As an important force in the economic development of the Asia Pacific region and even the world, China should continue to work to improve the breadth and depth of competition policy coverage in regional trade agreements, create more opportunities for its participation in the division of global value chains, and play a positive role in promoting regional economic integration. On the one hand, China should step up negotiations with potential RTA partners on the behind-the-border measures such as competition policy, and constantly expand the radiation scope of competition policy provisions in RTAs; On the other hand, China should

gradually upgrade and improve the signed RTAs, establish dispute settlement mechanisms and regulatory mechanisms to further enhance the depth of RTAs' competition policy provisions.

Acknowledgment

This work is supported by 2022 Anhui University of Finance and Economics Undergraduate Scientific Research Innovation Fund Project (No.: XSKY22111).

References

- [1] Horn H, Mavroidis P C, Sapir A.. Beyond the WTO? An Anatomy of EU and US Preferential Trade Agreements[J].*The World Economy*,2010,33(11):1565-1588.
- [2] Lawrence R Z, Institution B.. Regionalism, Multilateralism and Deeper Integration [J].*George Washington Journal of International Law & Economics*, 1996, 73(4) : 792.
- [3] Kohl T, Brakman S, Garretsen H.. Do Trade Agreements Stimulate International Trade Differently? Evidence from 296 Trade Agreements [J].*The World Economy*,2016,39(1):97-131.
- [4] Hofmann C, Osnago A, Ruta M.. Horizontal Depth: A New Database on the Content of Preferential Trade Agreements[J].*World Bank Policy Research Working Paper*,No.7981,2017.
- [5] Mattoo A, Rocha N, Ruta M. Handbook of Deep Trade Agreements[J].*World Bank Publications*,2020.
- [6] Orefice G, Rocha N.. Deep Integration and Production Networks: An Empirical Analysis [J]. *The World Economy*, 2014, 37(1):106-136.
- [7] Gao Jiang, Sheng Bin. Will the quality of trade agreements affect the global production network? [J] *World Economic Research*, 2018 (08): 3-16+135.
- [8] Xu Yayun, Yue Wen, Han Jian. The Impact of High level RTAs on Value Chain Trade -- A Study Based on the Depth of Rules Text [J]. *International Trade Issues*, 2020 (12): 81-99.
- [9] Lin Mengyao, Zhang Zhongyuan. Impact of competition policy on foreign direct investment in regional trade agreements [J]. *China Industrial Economy*, 2019 (08): 99-117.
- [10] Silva, J. S.,and S. Tenreyro. The Log of Gravity[J]. *Review of Economics and Statistics*, 2006, 88(4):641-658.