Research on RCEP Countries' Role in the Global Value Chain Concurrently on RECP Dividend to E-commerce in China

Xiaofei Luo[1], Jiahao Lai [2, *]

[1] Faculty of Logistics, Guangdong Mechanical and Electrical Technical College, Guangzhou, China
[2] School of Economics and Trade, Guangdong University of Foreign Studies, Guangzhou, China

lalabone@126.com

Abstract. The complex cross-border production cooperation promotes the trade of intermediate goods to become the mainstream of international trade, thus forming the labor system's global value chain division. In this context, the successful signing of the Regional Comprehensive Partnership Agreement has injected new momentum into the in-depth development of GVC. Based on the value chain perspective, this paper uses the value-added de-composition framework in non-competitive interregional input-output tables to explore the embedding condition and the role of RCEP countries in the GVC, which sheds light on cross border e-commerce in China.

Keywords: lobal Value Chain; RCEP, Value-added Decomposition Framework, Cross-border E-commerce

1 Introduction

With the rapid development of science and technology and the continuous reduction of transportation costs, the global fragmentation of product production has become an irresistible trend [2]. This has also formed a global value chain (GVC) division of labor system. Unlike traditional international trade, the formation of GVC does not take the product as the object but a process of product production and operation as the object; that is, economic entities participate in the GVC links by engaging in the production of parts and components or providing R&D, design and after-sales services, thus forming GVC. According to their own structural characteristics of factor endowments, as countries actively or passively participate in different divisions of the value chain, and they are in different positions of division of labor, the GVC system is also becoming more and more complete.

The Regional Comprehensive Partnership Agreement (RCEP) was successfully signed against the backdrop of the reshaping of GVC. The 15 RCEP countries are in-

H. Wu et al. (Eds.): CSIEDE 2022, ACSR 103, pp. 264–273, 2022.
https://doi.org/10.2991/978-94-6463-108-1_30

depth participants in global and regional value chains. Once the agreement is comprehensively implemented, it will have a profound impact on the reshaping of GVC. Meanwhile, e-commerce, as a cross-border sales channel with strong industrial drive and wide radiation, is an important link in the downstream of the global value chain. Due to the instantaneous nature of the Internet and the informationization of the production chain, the efficiency of information sharing and communication and collaboration among RCEP countries is further enhanced, and it is easier to realize knowledge spillover and technology spillover among countries in the same chain, which can promote the improvement of national technology and efficiency level and help RCEP countries extend deeper into the upstream and downstream ends of the value chain. From the perspective of GVC reshaping, this paper deeply discusses the impact of RCEP on the production network in the Asia-Pacific region, and believes that RCEP will accelerate the "regionalization" of GVC, making the production network in the Asia-Pacific region conceived by Japanese scholars after World War II [1]. The development model of China has accelerated its transformation to the "double-headed geese array" model with China and Japan as the leading geese. Relying on the huge platform of RCEP, China shall more deeply participate in the production network in the Asia-Pacific region and play a more important leading role, which will have a profound impact on China's construction of a new development pattern dominated by domestic circulation and dual circulation at home and abroad. China shall also encourage cross-border e-commerce and other new business models to foster the reconstruction of GVC.

2 Methodology

In terms of accounting methods, the research and application of GVC potential accounting based on the input-output model has become increasingly mature in the academic world. The GVC accounting method has formed an accounting framework with the input-output table as the tool, the export decomposition model and the production decomposition model as the theory model, and the GVC embeddedness index and GVC positional index as the primary measurement methods. The GVC position index reflects the relative upstream and downstream positions of the GVC potential by revealing the relative importance of the country (department) as the supply and demand side of intermediate goods. Koopman et al. (2008, 2010,2014) [3] [4] [5] and Wang et al. (2014) [7] first proposed the concept and measurement method of GVC status accounting based on the export value-added decomposition model framework, and constructed the GVC embeddedness and GVC division of labor. On this basis, Wang et al. (2017a) [8] constructed a production decomposition model, extending the export decomposition to production decomposition, so that the embeddedness index and production step index can be measured from the front and back perspectives, which not only overcomes the traditional participation rate The overestimation phenomenon caused by the total export as the denominator of the index, and the simple participation index and the complex participation index can be distinguished, which makes the measurement of embeddedness and division of labor more complete and accurate.

2.1 Data

Based on the Asian Development Bank (ADB) database, this paper has data for 13 countries and the sample time is 2007-2019, including Australia, Brunei Darussalam, Cambodia, Indonesia, Japan, Lao People's Democratic Republic, Malaysia, People's Republic of China, Philippines, Republic of Korea, Singapore, Thailand and Viet Nam.

2.2 GVC Embeddedness Rate

Under the production breakdown structure of Wang et al. (2017), this paper de-fines the forward correlation GVC embeddedness (GVCt_f) as the value added of the up-stream industry (imported in the process of participating in GVC activities) as a pro-portion of the final product or service of the national industry. The backward-linked GVC embeddedness (GVCt_b) is defined as the ratio of the value added of downstream industries (exported in the process of participating in GVC activities) to the total value added of the country, and the specific formula is as follows:

$$GVCt\_f = \frac{V\_GVC}{Va'} = \frac{V\_GVC\_S}{Va'} + \frac{V\_GVC\_C}{Va'} \tag{1}$$

$$GVCt\_b = \frac{Y\_GVC}{Y'} = \frac{Y\_GVC\_S}{Y'} + \frac{Y\_GVC\_C}{Y'} \tag{2}$$

2.3 GVC Position

In GVC embedding activities, GVC production steps not only exist at the beginning and end stages but also because value-added in the global production chain requires production activities to cross national borders, so there are potentially many intermedi-ate stages. Therefore, when a country participates in a GVC at a particular production stage, the fewer production stages it precedes, the more upstream the country is located at the particular GVC. Conversely, the country is downstream of GVC [9]. Finally, the ratio of the two indicators can be used to obtain the GVC position index. The specific formula is as follows:

$$PLv\_GVC = \frac{Xv\_GVC}{V\_GVC} = \frac{Xv\_GVC\_S}{V\_GVC\_S} + \frac{Xv\_GVC\_C}{V\_GVC\_C} \tag{3}$$

$$PLy\_GVC = \frac{Xy\_GVC}{Y\_GVC} = \frac{Xy\_GVC\_S}{Y\_GVC\_S} + \frac{Xy\_GVC\_C}{Y\_GVC\_C} \tag{4}$$

Thus, the GVC Position can be expressed as:

$$PLy\_GVCPs = \frac{PLv\_GVC}{PLy\_GVC^T} \tag{5}$$

2.4 GVC Structural Power

Pang and He (2021) [6] started from the GVC network, where power plays a role from the input-output channel based on the traceability results of Leontief decomposition.

They used the network location power index to aggregate the value-added network connections and constructed a network connection as an added value. The structural power indicator system of exporting and importing countries, the specific formula is as follows:

$$SP_{it}^{S} = \sum_{j \neq i} ln\left(\frac{T_t^{ij}}{EX_{jt}} + 1\right) \tag{6}$$

$$SP_{it}^{B} = \sum_{j \neq i} ln\left(\frac{T_t^{ji}}{EX_{jt}} + 1\right) \tag{7}$$

3 Empirical Results

3.1 RCEP Countries GVC Embedding Analysis

According to the network embedding theory, GVC is essentially an external network relationship embedding, which represents the interdependence, reciprocal exchange, mutual trust, and resource sharing between the focus enterprise and the cooperative enterprises within the GVC. As an international production cooperation network, GVC provides an opportunity for enterprises in emerging economies to obtain heterogeneous production factors from global partners and realize production linkages. RCEP countries can actively embed themselves in different links of the GVC division of labor by leveraging their resource endowment and capability advantages. According to the smile curve theory, the higher the upstream position of a country, the higher the level of development of industries with relatively lucrative profits and less competition, such as mining, energy, technology research and development, and other industries with high barriers to entry. Conversely, the higher a country's downstream embedded position is, the more focused it is on marketing, after-sales services, and other businesses, and the control of high value-added production links such as branding, sales, and services.

GVCt_f is the share of domestic value added generated by a country's GVC activities through downstream enterprises in the country's total value added. Therefore, the greater the GVCt_f, the higher the country's upstream position and the higher its upstream embeddedness. GVCt_b is the percentage of the added value of a country's participation in GVC activities through upstream companies in the total output value of final products and services. Therefore, the larger the GVCt_b, the higher the country's downstream position and the higher its downstream embeddedness. From the perspective of the GVC embedding degree of forward association, Brunei and Singapore have the highest embedding levels, 0.454 and 0.416, respectively. In contrast, China and Japan have the lowest embedding levels, 0.070 and 0.088, respectively. From the perspective of backward correlation GVC embedding, Brunei and Vietnam have the highest embedding levels, 0.434 and 0.381, respectively, while Australia and Japan have the lowest embedding levels, 0.085 and 0.092, respectively. Figure 1 shows the GVC embedding situation of RCEP countries, which mainly presents the following characteristics:

First, RCEP presents a pattern of high in the west and low in the east. As shown in the figure, countries such as Vietnam, Singapore, Brunei, Malaysia, and Thailand have relatively high GVC embeddedness, all above the level of 0.2. The GVC embeddedness of China and Japan is relatively low, below the level of 0.15. Among them, the forward-associative GVC embedding degree and the backward-associative GVC embedding degree range are 0.384 and 0.349, respectively. In addition, countries with higher levels of GVC embeddedness generally have a relatively minor economic scale and total population, which indirectly indicates that small countries depend more on GVC than large countries due to their smaller domestic market size. It shows that China can take advantage of the large-scale domestic market to provide strong support for effectively coping with international market uncertainty and promote the mutual promotion of domestic and international dual circulation.

Second, the internal embedding methods of RCEP are diverse. In general, the differences in the upstream and downstream embeddedness of RCEP are relatively high. For example, the upstream and downstream embeddedness differences in Vietnam, Cambodia, Australia, and Malaysia are 0.185, 0.175, 0.100, and 0.066, respectively. The possible influencing factor is that the industrial structure of the four countries is relatively simple, which reflects the considerable difference in the embeddedness of upstream and downstream. For example, in recent years, Vietnam has transformed and upgraded to export processing and manufacturing, and the share of natural resources exports has gradually decreased. Moreover, the rapid development of labor-intensive industries has also brought urbanization and driven the development of downstream links. Another example is that Cambodia's upstream agricultural exports are mainly fresh bananas, rice, dried cassava chips, and other foods, rather than necessary industrial raw materials such as ore and oil. Therefore, the upstream embeddedness of GVC is relatively low, and the consumption of international tourists directly drives local economic development, and brought opportunities for Cambodia to embed GVC. At the same time, Australia also has a massive gap between developed countries' upstream and downstream embeddedness. This is because Australia is a crucial ore-exporting country and is known as a "country sitting on a minecart". Compared with other industries, the added value output ability is weak, so Australia's GVC embedding method is relatively simple. In addition, RCEP countries such as Singapore, Cambodia, Viet Nam, Thailand, and Malaysia have a high degree of GVC downstream embeddedness, indicating that the distribution and sales links of these countries are deeply involved in the global division of labor, providing opportunities for China's e-commerce development.

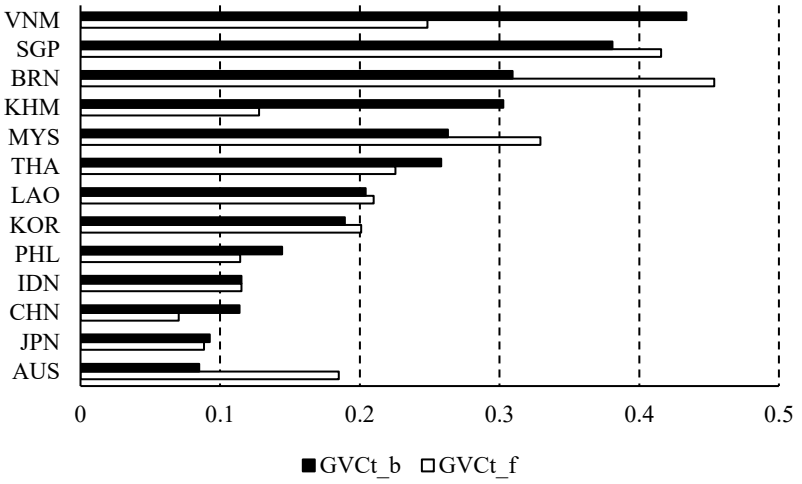

Fig. 1. Global value chain embedding in RCEP

3.2 GVC Positions of RCEP Countries

Given that the GVC position index does not visually indicate the location of a country and its sector in the GVC, it focuses only on the export trade segment but ignores the domestic demand segment and only reflects its distance from the upstream and downstream. Wang et al. (2017) propose the "GVC position index" based on value added, which redefines the GVC position at the country-sector level and extends the analysis framework upward to the production stage, correcting the shortcomings of the previous decomposition model and the current GVC position measurement index. Furthermore, it corrects the shortcomings of the previous decomposition model and the current GVC position indicators and provides a more complete and accurate picture of the roles of countries and sectors in GVC.

The GVC Position Index refers to the relative position of a country in the upstream and downstream of the international production network. The higher the GVC position index of a country, the more upstream the country is in the value chain. Conversely, the lower the GVC position of a country, the more downstream the country is in the value chain. In general, the RCEP regional division of labor has gradually become three-dimensional and networked, but the GVC location index of each country is highly volatile. China, Vietnam, the Philippines, and Thailand have fierce competition in the middle and lower reaches. In the upstream position, the value chain positions of Australia, Malaysia, and Japan are also constantly changing. However, the difference is that Australia and Malaysia participate in the upstream position of GVC through ore or energy export. At the same time, Japan's natural resources are relatively poor, mainly through technological research and development, advanced manufacturing Embed GVC upstream location. It is worth noting that South Korea is the only country in the RCEP countries that jumped from downstream to upstream. As shown in the figure, South

Korea continued to fluctuate and grow from 2007 to 2018 until it successfully jumped to the upstream position in 2019. China is also experiencing rising volatility, but as of 2019, the GVC position is still at 0.966, which is still a certain distance from the upstream. It also shows that China is moving up the upstream links of GVC, such as scientific and technological research and development and achievement transformation. In summary, the division of labor among RCEP countries is relatively clear. With the reduction of trade barriers in each country, Chinese e-commerce enterprises can better utilize the differentiated advantages of each country and promote the formation of a unified RCEP market.

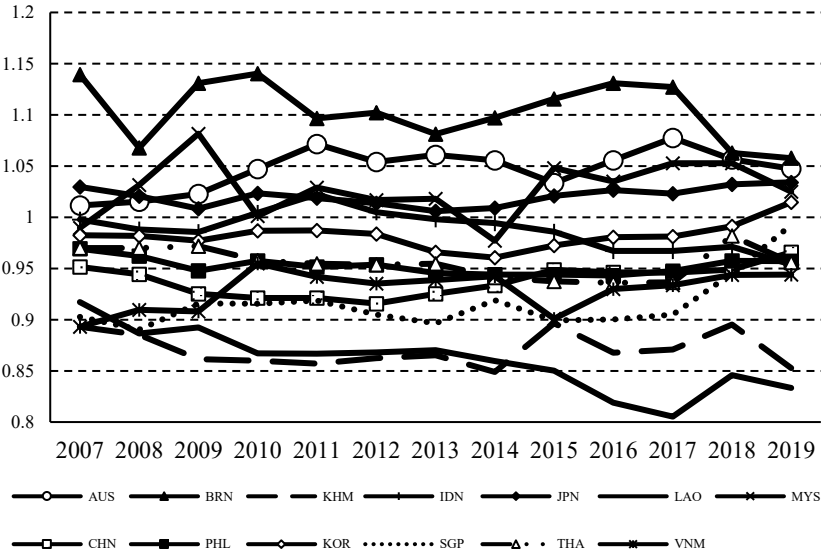

Fig. 2. Global value chain position in RCEP

3.3 GVC Positions of RCEP Countries

According to the basis and form of power, international relations research roughly divides it into three categories: "strength is power", "relational power," and "structural power". Structural power is mainly put forward to "strength is power". Reflection and questioning are mainly manifested in the degree of response of the structure to changes in a particular structural position and the cost of adjustment. GVC is a global cross-enterprise network organization that realizes the value of goods or services and covers the process of production, sales, and recycling. The whole process involves the collection and transportation of raw materials, the production and distribution of semi-finished products and finished products, and final consumption and recycling. The deep structure of added value gives birth to structural power, and its distribution and changing trends reflect the essential characteristics and evolution of the international pattern from the economic level.

First, East Asian countries have strong leadership capabilities. From 2007 to 2019, China, Japan, South Korea, and Singapore have always been in the top four of GVC structural power. Only Singapore is an ASEAN country of the four countries, and the other three are developing countries, which shows that East Asian countries are valuable in the RCEP region. The chain has absolute leadership. In addition, China has consistently ranked first. In 2019, China's GVC structure power reached 2.145, surpassing Singapore's second-ranked Singapore by about 1.480. It may be because China, as a "world factory", has a high degree of association with the GVCs of various countries. Among them, the deep structure of added value gives birth to China's structural power in GVC. At the same time, this also provides a strong guarantee for China to resist the epidemic and trade sanctions and to promote the rapid development of e-commerce, evern to promote new merge of cross-border e-commerce platforms in different RCEP member countries.

Second, the structural power of ASEAN countries is generally weak but proliferating. The structural power of ASEAN countries is relatively insufficient. Excluding Singapore, the country with the highest GVC structural power in 2019 is Thailand, which is only 0.472, about 22% of China. However, the structural power of many countries within ASEAN has maintained rapid growth, of which Laos has grown the fastest, with an increase of 266.4% in the 13 years from 2007 to 2019. Second, Vietnam, Cambodia, Thailand, and Singapore increased by 238.2%, 102.6%, 64.3%, and 47.1%, respectively. Therefore, China should take advantage of the rapid development of ASEAN countries to speed up the regional value chain embedded in RCEP, ease the increasing labor costs, and enhance the price competitiveness of e-commerce export.

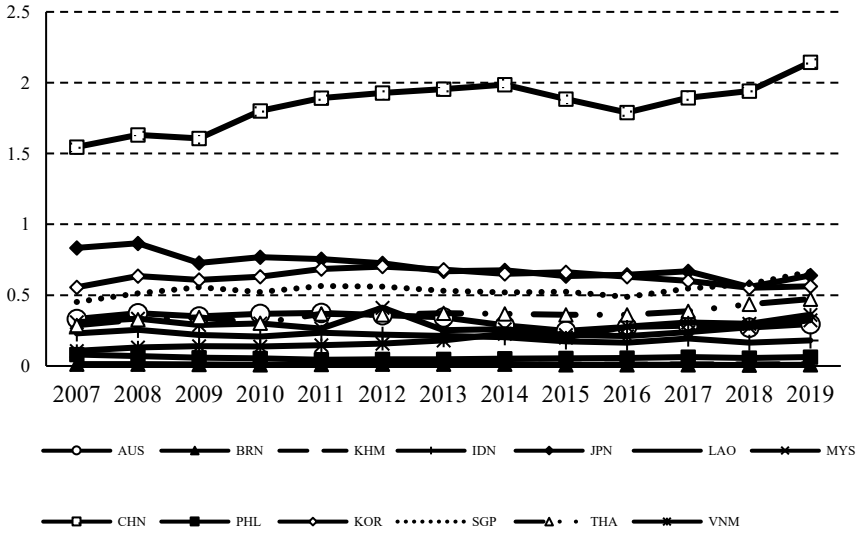

Fig. 3. Global value chain structural power in RCEP

Third, the structural power of developed countries in East Asia is declining. The structural power of Japan and South Korea is generally in a downward trend of volatility. Japan has maintained a downward trend of volatility from 2007 to 2019; as of 2019, it has dropped by 23.3%, while South Korea has maintained rapid growth from 2007 to 2012. It increased from 0.555 to the level of 0.702 and then fell rapidly. As of 2019, it has dropped to 0.563, an increase of only 1.1% in 13 years. It may be because the two countries have entered the post-demographic dividend period, the superimposed population has entered negative growth, the labor costs of enterprises have been rising, and many manufacturing links have been transferred overseas, thus reducing structural power. The stagnation of development in Japan and South Korea has created new opportunities for China to climb the value chain. Benefiting from the RCEP policy dividend, China should strengthen GVC cooperation with Japan and South Korea to take brands advantage, strive for knowledge and technology spillovers, and promote high-quality development of cross-border e-commerce. Meanwhile, developing e-commerce can also effectively promote the regional circulation of RCEP commerce trade, accelerate the reconstruction of GVC, and thus accelerate the rise of China's position in GVC.

4 Conclusion

Based on the production decomposition model of the world input-output table of Wang et al. (2017), this paper further expands the WOID decomposition model of Koopman et al. (2008, 2010, 2014) and Wang et al. (2014) [7]. Through the world input-output table from 2007 to 2019, Under the unified decomposition system, RCEP's embedding of GVC and regional cooperation in the domestic value chain in recent years are discussed from the perspective of value-added circulation. This paper finds that: First, RCEP countries are deeply embedded in GVC and show a pattern of high in the west and low in the east, but relatively speaking, the embedding methods between and within countries are pretty different. Secondly, RCEP has gradually become three-dimensional and networked in the division of labor in the mid-region of GVC. However, at the same time, the competitiveness of the mid-and downstream regions of the region is also gradually strengthening. Thirdly, among the RCEP countries, East Asian countries have strong GVC structural power, but the structural power of developed countries in East Asia shows a downward trend. In contrast, the structural power of ASEAN is relatively weak but maintains rapid growth. Finally, China should actively use the dividends from the signing of RCEP to optimize its e-commerce development strategy, deploy regional value chains, and promote the construction of a unified Asian market.

Acknowledgements

This work is supported by Major Program of National Social Science Foundation of China (21&ZD074), National Natural Science Foundation of China (71873041; 72073037), Natural Science Foundation of Guangdong Province (2021A1515011814),

2021 Program of Guangdong Philosophy and Social Sciences (GD21CYJ02; GD21YYJ05).

Jiahao Lai is the corresponding author, the email is lalabone@126.com.

References

1. Dowlinga, M., and Chia T. C. (2000). Shifting comparative advantage in Asia: new tests of the "flying geese" model. Journal of Asian Economics Vol.11(4): 443-463.
2. Gereffi, G. .(2014). Global value chains in a post-washington consensus world. Review of international political Economy, Vol.21(1): 9–37.
3. Koopman, R., Power, W., Wang, Z. & Wei S. J. (2010). Give Credit Where Credit is Due: Tracing Value Added in Global Production Chains, National Bureau of Economic Research Working Paper No.16426.
4. Koopman, R. Wang, Z., and Wei, S. J. (2008). How Much of Chinese Exports is Really Made in China? Assessing Domestic Value-Added When Processing Trade is Pervasive, National Bureau of Economic Research Working Paper No.14109.
5. Koopman, R., Wang Z. and Wei S. J. (2014). Tracing Value- Added and Double Counting in Gross Exports, American Economic Review, Vol. 104(2), 459~494.
6. Pang, X. & He, Q.Q. (2021). Structural Power in Global Value Chains and the Evolution of International Patterns, Social Sciences in China . Vol.09, 26-46+204-205.
7. Wang, Z., Wei, S. J. & Zhu, K. (2014). Quantifying International Production Sharing at the Bilateral and Sector Levels, National Bureau of Economic Research Working Paper No.19677.
8. Wang Z, Wei S-J, Yu X, et al. Measures of participation in global value chains and global business cycles. National Bureau of Economic Research, 2017a.
9. Wang Z, Wei S-J, Yu X, et al. Characterizing global value chains: production length and upstreamness. National Bureau of Economic Research, 2017b.