

Study on the Trade Structure and Deepening Development of Regional Production Network in East Asia

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Abstract: We use the data provided by the UN COMTRADE database to calculate and analyse the trade structure of 10 East Asian economies. The results show that the proportion of intra-regional trade in East Asian economies has further increased, and the scale of trade in intermediate products still accounts for the largest proportion, while China is still the processing and manufacturing center of East Asian production network. At the same time, the export of final consumer goods in East Asia is mainly concentrated in countries such as the United States and Europe. The external dependence of economic growth in the region is still high, which leads to the weak ability of East Asia to cope with external shocks. As the main source of Global trade surplus, East Asia must strengthen the cooperation among the economies in the region, and actively adjust the trade structure in order to select the optimal path for the transformation of economic growth mode.

1. Introduction

After the Second World War, with the support of the United States, Japan has successfully implemented the export-oriented economic development strategy, and its domestic economy was revived and developed rapidly. Since the 1970s, through direct investment, Japan has continuously transferred industries that are mature in domestic development and gradually lose their comparative advantages to the emerging industrialized economies in East Asia, and gradually established an international division of labour system in East Asia with Japan as the core, namely the “Flying Geese Paradigm”. Under the Flying Geese Paradigm, the earlier developed economies in East Asia realized the gradient transfer of low-level industries through foreign direct investment according to their comparative advantages. At the same time, these relatively developed countries have established new high-tech industries in domestic and realized the upgrading of their industrial structure. The economies of East Asia have formed a vertical pattern of division of labour between industries. Under the guidance of this mode, East Asian countries and regions have achieved rapid economic growth. Since then, the international division of labour system in East Asia has experienced a transformation from inter-industry division, intra-industry division to intra-product division. The production network in the East Asia region has gradually formed, and the production of products has been refined into multiple production links, which have been completed by a number of countries and regions. East Asia has gradually become the most active region in the global economy, and its role in the global production system has become increasingly prominent.

However, with the rapid development of the production network in East Asia, it is not difficult to find that it relies heavily on the outside of the region in terms of capital, technology and market, and it needs to rely on the demand of the external market to promote its operation. Rongyan Wang (2011) thought that although the East Asian regional production network has been developing rapidly and has a growing influence, its dependence on the extra-regional market has not weakened. The East Asian regional production network with China as the core still depends on the coordination of trade and investment policies of countries around the world, and take the cultivation of the final demand market inside the region as a long-term goal.^[1] At present, the economic operation pattern of East Asia is difficult to continue in a static way. Guijun Lin and Bi Tang (2012)

believed that the consolidation of the division of labour made East Asian economies face new difficulties in technological progress. The import of parts and components and export of assembly products made the developing economies in East Asia more and more seriously affected by the fluctuations of developed economies.^[2] Chao Hu and Xinze Wang (2012) believed that the transformation of East Asia's regional production network in the post-crisis era was to climb to a high value-added link and build the final demand market, which was an inevitable choice for East Asia's development and transformation.^[3] Xuedang Zheng (2017) believed that there was a lack of leading enterprises with a complete industrial chain in East Asia, which made East Asian economies can only passively process, assemble and re-export.^[4] Hongzhong Liu (2019) pointed out that under the background of anti-globalization, it is very difficult for East Asia to enjoy a loose international environment, and the export-oriented economic growth mode of East Asia is facing a huge challenge. Changing this growth mode is the only choice for East Asia.^[5] In a word, the cost advantage of some East Asian economies is declining, the environmental problems are prominent, and the sustainability of development is facing challenges. At the same time, some developed countries such as the United States strongly advocate manufacturing and capital return to the country. Therefore, the adjustment of the production network in East Asia and the optimization and upgrading of the intra-regional trade division structure are imperative.

2. Trade structure of regional production network in East Asia

This section uses the data provided by the UN COMTRADE database to carry out statistical research on 10 countries and regions with large-scale trade in East Asia, so as to make a detailed analysis of the trade pattern of the regional production network in East Asia.

2.1. Economic linkages and division of labour within the East Asian region

East Asian economies are rich in labour resources and their factor endowments have a certain degree of difference, especially the government's public service supply capacity is strong.^[6] Under the influence of significant economies of scale, East Asia is becoming the dominant regional production network in the world. Since 2008, East Asia, with nearly 30% of the world's population, continues to be a global industrial and trade gathering area. In 2016, the industrial scale of 11 East Asian countries and regions including Taiwan reached 36.8% of the world's, and the proportion of manufacturing industry reached 42.3%. The proportion of commodity exports of the 10 East Asian countries and regions excluding Taiwan rose from 24.6% in 2008 to 30.2% in 2016, the proportion of commodity imports rose from 22.1% to 26.7%, the proportion of service exports rose from 15.8% to 17.8%, and the proportion of service imports rose from 18.4% to 23%. At the same time, the deepening of the division of labour in the East Asian region has been further strengthened.

2.1.1. The proportion of intra-regional trade in East Asia continues to rise.

From 2000 to 2012, the proportion of 10 East Asian countries and regions' exports to the region's total exports increased from 42.2% to 47.8%. Subsequently, affected by the global economic downturn, the proportion fell slightly to 45.9% in 2016. This means that the economies in East Asia are increasingly connected, and the commodity trade in East Asia is more concentrated in the intra-regional market. In the same period, the share of intra-regional imports in total East Asian import trade declined from 48.0% to 43.1%, and rose to 46.9% in 2016. Specifically, from 2000 to 2008, among the 10 countries and regions in East Asia, only China and Vietnam's exports to East Asia accounted for a decline in the proportion of their total exports, and China's and Singapore's imports from East Asia accounted for a decline in the proportion of their total imports. The proportion of intra-regional trade of other countries and regions in their domestic trade has increased or remained basically unchanged. From 2008 to 2016, the proportion of all these countries and regions' exports to the region increased first and then decreased slightly. Apart from China, Hong Kong, South Korea and Singapore's imports from East Asia decreased first and then increased slightly, other countries continued to increase their imports from East Asia. In 2000, only Indonesia and Singapore exported more than 50% to East Asia, while in 2016, only China, Japan, Thailand and Vietnam

exported less than 50% to East Asia. Among them, Hong Kong's exports to the region accounted for the highest proportion in 2016, reaching 67.2%. In addition, from the perspective of the changes in the proportion of intra-regional imports of East Asian economies, Indonesia rose the fastest from 2000 to 2008, up 11.9 percentage points, and its proportion of intra-regional imports rose to 63.9% in 2016. The largest increase between 2008 and 2016 was in the Philippines, which increased by 12.9 percentage points. Hong Kong, the Philippines and Vietnam's intra-regional imports accounted for the highest proportion of their total imports in 2016, accounting for 70.7%, 66.0% and 69.5% respectively. From the perspective of the overall changes in the proportion of imports and exports of the 10 East Asian countries and regions, China's intra-regional trade has declined significantly, which also shows that in recent years, China has taken on more of the role of total exports and imports of East Asia. At the same time, Singapore has increased the proportion of overseas procurement, and the proportion of import in the region has declined significantly. The share of import and export in the Philippines has increased substantially. This is due to the rapid development of its domestic manufacturing and service industries. See Table 1 below.

Table 1 Share and change of intra-regional trade of 10 East Asian countries and regions (%).

year	CHN	HKG	IDN	JPN	MYS	PHL	KOR	SGP	THA	VNM	East Asia
Proportion of exports to East Asia in total exports											
2000	45.8	47.7	54.4	32.6	50.0	40.2	40.3	52.0	43.2	49.6	42.2
2004	41.0	57.6	55.3	40.0	50.8	54.7	44.6	56.9	48.4	41.6	46.1
2008	34.4	60.7	56.2	41.9	53.8	56.5	44.6	59.4	47.7	39.2	44.2
2012	36.9	69.3	58.2	46.9	58.4	64.3	51.6	61.0	49.8	42.9	47.8
2016	35.9	67.2	51.3	44.6	56.7	62.0	51.4	62.2	47.1	38.7	45.9
Percentage change											
2000-2008	-11.4	13.1	1.8	9.3	3.9	16.3	4.3	7.4	4.5	-10.3	2.0
2008-2016	1.5	6.4	-4.9	2.7	2.9	5.4	6.8	2.8	-0.6	-0.5	1.7
Proportion of imports from East Asia in total imports											
2000	42.7	70.2	48.6	35.5	56.6	48.6	39.6	57.9	50.4	66.2	48.0
2004	41.1	72.5	50.7	40.3	57.4	52.7	44.8	53.6	52.4	63.0	48.9
2008	34.6	73.5	60.5	36.2	56.6	53.2	41.2	48.6	49.3	65.8	44.7
2012	30.7	69.6	62.2	39.8	59.4	53.9	37.9	44.9	53.3	67.0	43.1
2016	32.2	70.7	63.9	44.8	59.9	66.0	44.1	49.5	57.8	69.5	46.9
Percentage change											
2000-2008	-8.1	3.3	11.9	0.7	0.0	4.6	1.6	-9.3	-1.0	-0.4	-3.3
2008-2016	-2.4	-2.8	3.4	8.6	3.3	12.9	2.9	0.9	8.5	3.8	2.2

Notes: Calculated according to the UN COMTRADE database. "East Asia" contains only the 10 economies.

2.1.2. The proportion of trade in intermediate products continues to rise.

In 2016, the total export volume of intermediate products in East Asia reached US \$1410.1 billion, accounting for 63.37% of the total export volume in East Asia, of which the trade volume of parts and components was US \$779.7 billion, accounting for 35.0% and the trade volume of semi-finished products was US \$630.4 billion, accounting for 28.3%. From the perspective of the overall composition of the export commodities in East Asia, the proportion of intermediate product trade basically remains above 60%. In 1995, the proportion of intermediate product exports of eight countries and regions in East Asia was 59.3%, and it has been increasing year by year since then. In 2008, exports of intermediate products accounted for 65.4% of total regional exports, which is the highest level in history. In 2016, the proportion of intermediate products in 10 East Asian countries and regions decreased to 63.4%. Among them, the proportion of parts exports in 2016 accounted for 35.0% of the total exports in the East Asian region, reaching the highest level in history. In a word, the trade proportion of intermediate products and final products is still unbalanced in the East Asian regional production network. That is, the proportion of intermediate products is too high while that of final products is too low. See Table 2 below.

Table 2 Composition of export commodities in East Asia from 1995 to 2016 (%).

year	primary product	semi-finished goods	components and parts	Intermediate product	Capital goods	consumer goods	Final product
1995	4.4	34.7	24.5	59.3	17.6	18.8	36.4
2002	3.7	30.2	32.3	62.5	16.7	17.1	33.8
2006	4.0	30.8	33.2	64.0	19.2	12.8	32.0
2008	4.4	33.8	31.6	65.4	18.6	11.7	30.3
2010	4.1	30.8	32.8	63.6	20.0	12.3	32.2
2013	3.8	32.4	31.5	63.9	18.9	13.4	32.3
2016	3.1	28.3	35.0	63.4	19.0	14.5	33.6

Notes: Calculated according to the UN COMTRADE database.

In particular, East Asia maintains a high export volume of intermediate products to China, while China maintains a large-scale export of intermediate products to the United States and the European Union.^[7] This shows that with the economic development of China and the upgrading of industrial structure, the processing and manufacturing capabilities of China's intermediate products continue to increase, and China is gradually extending to both ends of the East Asian production network. The scale of East Asia's intermediate product trade has always occupied the absolute position of East Asian commodity trade, which plays an important role in the operation of the East Asian production network under the current mode.

2.1.3. China continues to strengthen its position as a processing and manufacturing center.

Table 3 Trade volume of major economies in East Asia from 2008 to 2016 (%)

year	items	CHN	HKG	IDN	JPN	MYS	PHL	KOR	SGP	THA	VNM	East Asia
2008	Primary goods import from	14.7	4.9	30.7	9.2	13.1	1.6	2.1	1.9	9.5	12.5	100
	Primary goods export from	26.2	3.6	2.9	26.7	6.0	2.5	16.6	10.4	4.1	1.0	100
	Semi-finished goods import from	22.2	8.5	6.7	20.9	7.8	0.9	15.0	12.1	5.0	0.8	100
	Semi-finished goods export from	26.6	12.0	7.1	14.2	6.3	2.7	13.0	7.5	5.6	5.2	100
	components and parts import from	22.0	21.5	1.1	18.2	3.7	2.7	10.7	16.2	3.7	0.5	100
	components and parts export from	35.9	19.7	3.9	10.1	6.8	2.6	7.7	7.1	4.9	1.3	100
	Capital goods import from	41.7	10.4	1.2	19.3	3.2	1.6	10.8	7.1	4.3	0.4	100
	Capital goods export from	23.8	26.3	5.2	12.2	5.6	1.7	8.7	9.4	4.3	2.7	100
	Consumer goods import from	49.7	11.3	2.8	10.4	3.5	0.9	4.0	6.9	7.2	3.3	100
	Consumer goods export from	13.5	20.5	3.8	31.8	5.6	3.4	8.3	6.9	3.6	2.6	100
2016	Primary goods import from	25.5	3.7	31.9	8.0	8.9	3.1	1.9	1.7	7.8	7.6	100
	Primary goods export from	28.4	5.4	2.1	16.0	19.6	3.1	9.7	7.1	6.1	2.6	100
	Semi-finished goods import from	29.3	12.3	4.7	15.0	6.8	1.0	13.8	9.4	5.2	2.6	100
	Semi-finished goods export from	30.0	9.0	7.1	10.8	6.8	4.0	9.8	6.4	6.6	9.4	100
	components and parts import from	25.8	24.8	0.8	11.2	4.5	2.3	13.4	11.8	3.1	2.1	100
	components and parts export from	38.9	22.5	2.6	7.4	5.6	2.0	6.9	4.7	4.2	5.1	100
	Capital goods import from	50.9	9.3	0.8	13.0	2.8	1.3	10.3	6.3	3.5	1.9	100
	Capital goods export from	21.7	28.6	4.2	10.9	7.2	2.8	8.6	6.4	4.6	5.0	100
	Consumer goods import from	50.0	7.8	4.1	7.4	3.5	0.8	5.4	6.6	7.3	6.9	100
	Consumer goods export from	15.0	20.1	3.8	24.0	5.0	5.8	9.2	5.5	5.0	6.7	100

Notes: Calculated according to the UN COMTRADE database. "East Asia" contains only the 10 economies.

Based on the data in Table 3, in terms of the flow direction of trade goods of East Asian economies, China has become the processing and manufacturing center in East Asia and the main inflow place of East Asian intermediate products trade. In 2008, primary products in the East Asian region were mainly imported from Indonesia, accounting for 30.7%. Of the 10 countries and regions in East Asia, 26.7% of their primary product exports went to Japan and 26.2% to China. In addition, China has become the primary importer and exporter of semi-finished products and parts in the region, and is also the leading exporter of capital goods and consumer goods in the region.

East Asian economies imported 41.7% of capital goods and 49.7% of consumer goods from China in 2008. By 2016, the core position of China's intermediate product trade was more significant. Among the 10 countries and regions in East Asia, 28.4% of the exports of primary products, 30.0% of the exports of semi-finished products and 38.9% of the exports of components and parts all flowed to China, accounting for the highest proportion in the region. In the East Asia region, 50.9% of capital goods imports and 50.0% of consumer goods imports came from China, and the proportion was higher than that in 2008. It also reflected that China has become the processing and assembly base for final products in East Asia.

The cheap labour resources owned by China have enabled the rapid development of processing and manufacturing, which creates conditions and possibilities for the networking process decomposition of modules. The huge economies of scale have attracted the manufacturing industry to further gather in East Asia, and it has also established East Asia's status as “the Belt and Road” manufacturing center.

2.2. Trade relations between East Asian production network and external markets

In the development process of East Asia, although the production capacity of the East Asian regional production network is expanding, the region lacks an effective consumer market and relies heavily on the extra-regional markets such as the United States and Europe, resulting in a high trade surplus in East Asia. By analysing the trade of final products in East Asia, we can find that the export of final products in East Asia is highly dependent on the markets outside the region. The following is an analysis of the export of capital goods and consumer goods of 10 countries and regions in East Asia. As shown in the table below, in the capital goods export trade of 10 East Asian countries and regions in 2016, the exports of these 10 economies to the internal market of the region accounted for 39.2% of the total exports, and the exports to the external market accounted for 60.8% of the total exports. Obviously, the exports of capital goods were very dependent on the external market. Among the ten economies in the region, China, Thailand and Vietnam accounted for a relatively small proportion of capital goods exports to East Asia, which were 37.7%, 38.7% and 18.9% respectively. Among them, China mainly exported capital goods to Europe and the United States, while other countries in East Asia exported more than 40% of capital goods to East Asia. As the main import market of capital goods in East Asia, China and Hong Kong have absorbed many capital goods exports from East Asia, accounting for 8.5% and 11.2% respectively, followed by Japan 4.3%, while other intra-regional economies have absorbed less than 4% of capital goods exports from East Asia. See Table 4 below.

Table 4 Market distribution of capital goods exports of East Asian economies in 2016 (%)

Importer	Exporter										
	CHN	HKG	IDN	JPN	MYS	PHL	KOR	SGP	THA	VNM	East Asia
CHN		30.2	3.2	17.5	10.4	20.1	22.8	12.0	5.6	5.1	8.5
HKG	18.0		2.3	3.7	5.0	9.3	3.7	6.2	7.4	1.6	11.2
IDN	1.4	0.6		1.6	2.7	1.2	0.8	9.3	2.4	0.5	1.7
JPN	5.0	4.0	9.9		6.9	13.9	2.7	5.6	8.8	2.9	4.3
MYS	3.1	1.2	3.5	1.4		1.0	2.1	9.3	4.6	1.5	2.8
PHL	0.8	0.8	1.5	2.2	1.0		0.8	2.6	1.8	0.8	1.1
KOR	3.7	1.3	2.5	6.6	1.8	3.1		5.4	1.1	2.7	3.4
SGP	2.4	0.2	19.3	2.8	10.3	2.2	2.7		4.1	1.6	2.5
THA	1.5	1.7	5.9	3.2	6.6	1.6	0.7	2.8		2.2	1.8
VNM	1.7	1.4	2.1	2.0	1.6	0.9	3.8	3.5	2.8		2.0
East Asia	37.7	41.5	50.0	41.1	46.2	53.5	40.1	56.6	38.7	18.9	39.2
Out of region	62.3	58.5	50.0	58.9	53.8	46.5	59.9	43.4	61.3	81.1	60.8
world	100	100	100	100	100	100	100	100	100	100	100

Notes: Calculated according to the UN COMTRADE database. "East Asia" contains only the 10 economies.

In addition, from the perspective of the export of consumer goods of 10 countries and regions in

East Asia, the proportion of consumer goods absorbed by the inner market of East Asia in 2016 was only 28.9%, while the export to the outer market accounted for 71.1% of the total export of consumer goods, about 2.5 times of the inner market capacity. It was obvious that the export of consumer goods of East Asian economies also relied heavily on the markets outside the region. Among the ten economies in East Asia, Japan was the most important import market of consumer goods in East Asia, absorbing 6.9% of the export of consumer goods in East Asia. Hong Kong and Mainland China accounted for 5.8% and 4.3% of East Asian consumer goods exports respectively, while other economies accounted for less than 3% of East Asian consumer goods exports. It was worth noting that Singapore's consumer goods were mainly exported to the East Asia region, and it was the only one of the ten economies whose consumer goods' export market was concentrated in the region. See Table 5 below.

Table 5 Market distribution of consumer goods exports of East Asian economies in 2016 (%)

Importer	Exporter										
	CHN	HKG	IDN	JPN	MYS	PHL	KOR	SGP	THA	VNM	East Asia
CHN		20.4	4.4	8.0	4.2	5.9	10.6	8.1	6.4	9.0	4.3
HKG	8.1		2.7	4.1	2.9	3.7	3.4	8.8	3.1	1.4	5.8
IDN	0.9	0.4		0.5	3.3	1.4	0.7	6.9	2.5	0.6	1.1
JPN	7.7	6.3	7.0		6.7	15.6	5.3	9.0	11.1	9.4	6.9
MYS	1.3	0.6	3.5	0.8		2.1	0.4	8.4	2.2	0.9	1.4
PHL	1.5	0.7	5.5	0.6	2.1		1.4	2.7	4.3	1.2	1.7
KOR	2.8	1.9	2.3	2.0	1.5	5.6		4.7	1.3	6.3	2.7
SGP	1.3	0.3	5.4	1.4	13.9	1.7	0.8		2.0	0.8	1.6
THA	1.3	0.9	2.6	0.8	6.7	2.7	0.7	6.9		1.3	1.4
VNM	1.6	3.8	2.5	0.7	4.0	1.2	3.0	5.0	4.3		1.9
East Asia	26.4	35.2	35.9	18.8	45.4	39.9	26.4	60.5	37.2	30.9	28.9
Out of region	73.6	64.8	64.1	81.2	54.6	60.1	73.6	39.5	62.8	69.1	71.1
world	100	100	100	100	100	100	100	100	100	100	100

Notes: Calculated according to the UN COMTRADE database. "East Asia" contains only the 10 economies.

In a word, East Asia has basically formed a division system of industrial value chain in which the semi-finished products and parts produced by other East Asian economies, processed and assembled by the Chinese mainland, and then exported to the European and American markets. The final products are assembled in China and exported out of the region. The realization of the value of the product is heavily dependent on the external market. The trade surplus of East Asia to the outside of the region is shown in the form of China's trade surplus to the outside of the region.

3. Conclusion

Under the increasingly severe international situation, the external living space of the East Asian regional production network is being seriously squeezed, the demand of the market outside the region is extremely unstable, and the current operation mode of the East Asian regional production network is obviously unsustainable. Therefore, in order to change the development mode of production in East Asia, consumption in Europe and the United States, and multinational companies obtain most of the trade benefits, the East Asian production network must be adjusted.

First, East Asia should actively develop diversified markets outside the region and promote the formation of the ultimate consumption market within the region. The developing economies in East Asia should actively adjust, optimize and upgrade their industrial structure, attach importance to technological innovation and strive to participate in the high-level stage of division of production. Second, East Asia should accelerate the decentralized development of export platforms. This can not only promote the developing countries in East Asia to further participate in international division of labour and cooperation and achieve inclusive growth, but also transfer China's trade surplus with the United States, disperse the risk of over concentration of East Asian export platforms and reduce the occurrence of trade frictions. Third, East Asia should actively promote

monetary cooperation in the region.^[8] By strengthening monetary cooperation and promoting a unified currency within the region, it can finally resolve East Asia's dependence on the US dollar and stabilize intra-regional financial affairs. Fourth, East Asia should strengthen the degree of regional economic integration and actively promote the construction of free trade areas. The long-term and sustainable East Asian production network needs the support of economic and institutional integration. The expansion of the scale of East Asian economic cooperation and the improvement of the level of institutionalization can create more economic benefits. In the future, East Asia should actively build a large-scale free trade area. It can help stimulate the domestic demand of the region on the one hand, on the other hand, it can explore and create a new economic growth mode.

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