



China's Opening up after 40 Years: Standing at a Historic Turning Point

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Abstract

This paper comprehensively reviews China's openness since 1978 from three aspects: trade, foreign investment and global production sharing. We point out that the economic development of China is now standing at a historic turning point. Specifically, economic changes in China are discussed from four dimensions: (i) from China being a world assembly line to a world manufacturing powerhouse; (ii) from China being a world capital receiver to a world investor; (iii) from China being a world factory to a world market; and (iv) from the situation of "made in China" to "innovated in China." At the same time, the global economic system has also reached a turning point. A "North America–Europe–Asia" tri-polar system has formed, in which the USA, Germany and China, respectively, serve as the regional core economies.

Key words: foreign direct investment, global production sharing, reform and opening-up policy, trade, turning point

JEL codes: F10, F15, O10

I. Introduction

Following the implementation of the reform and opening-up policy in 1978, China's "growth miracle" continued for the next four decades, with remarkable changes in terms of economic size, economic structure as well as China's role in the world economy.¹

The growth miracle of China has long been a hot topic in economic research (Lin et al. 1996; Feenstra and Wei, 2012). The opening up of trade and investment has provided essential support for the development of China's economy. As depicted in the two-

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¹In this paper, "China" refers to "Chinese mainland."

gap model in Chenery (1967) and Chenery and Strout (1968), many developing countries suffer from either a shortage of domestic savings to provide finance for investment opportunities or a shortage of foreign exchange to pay for imports of capital and intermediate goods. China's opening-up policy has filled these two gaps simultaneously. Besides this, there have been additional gains through the inflow of new technologies, increased competition in the domestic market and more foreign market opportunities.

China seized the opportunities brought by the opening-up policy and entered the stage of high-speed growth. Today, China is the largest or the second largest country in the world in terms of GDP, trade, investment and consumption. China's role in the global economy has shifted from that of a big trading country to a major producer, capital investor, consumer and innovator. The economic development of China has reached a turning point.²

In the meantime, the global economic system has also changed dramatically. China has replaced Japan as the core economy of the Asian economic network. A new tri-polar world order has formed, comprising North America, Europe and Asia, for which the USA, Germany and China are at the core.

The present paper reviews China's high-speed growth in trade, foreign investment and global production sharing during the past 40 years. In particular, we emphasize the key changes in China's current economic development stage and the global economic system. Our paper proceeds as follows. Sections II, III, IV and V discuss structural changes in trade and production sharing, foreign direct investment (FDI), consumption and innovation, respectively. Section VI examines the changes in China's economic role in the global economic system. Section VII concludes.

II. From a World Assembly Line to a World Manufacturing Powerhouse

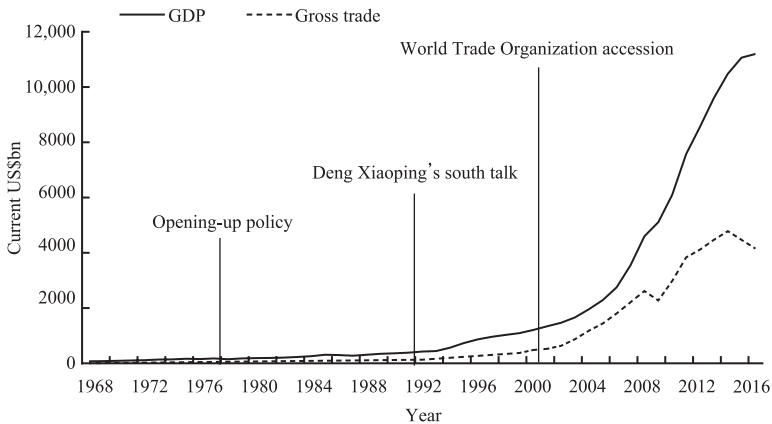
1. Growth Miracle in China

The high-speed growth of international trade is an essential factor in promoting China's economic development. As shown in Figure 1, the growth of China's GDP and international trade is highly synchronous. After adopting the opening-up policy in 1978, China's GDP and trade volumes started to grow steadily. The growth miracle appeared

²Several recent papers also focus on the turning point of China's economic growth, such as Cai and Du (2011), Lemoine and Unal (2017) and Qian et al. (2017).

after two major turning points. One was former leader Deng Xiaoping's Southern Talk; another was China's World Trade Organization (WTO) accession. After the financial crisis in 2008, China's openness entered a transition period in which a series of turning points can be identified.

Figure 1. China's GDP and Total Trade Volume, 1968–2016



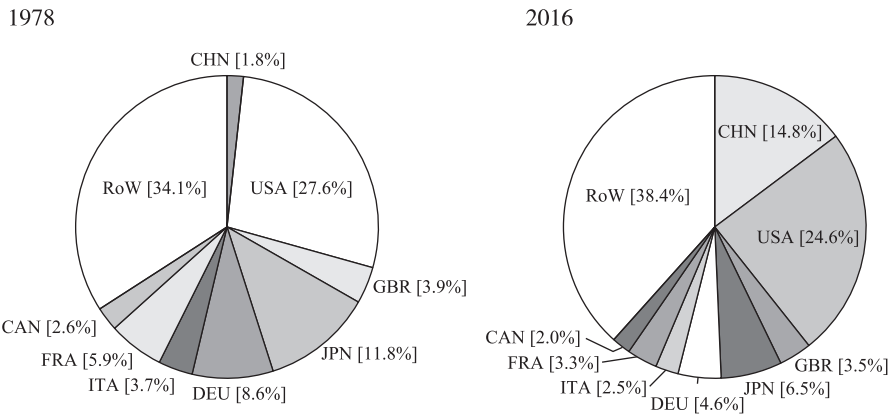
Source: The World Bank, World Development Indicators.

After the outbreak of the global financial crisis in 2008, China's foreign trade fluctuated, with only a slight decrease, and the impact on GDP growth was even weaker. The overall optimistic growing trend did not change at all. In 2008, China replaced Germany as the world's largest exporting country and has maintained its place up to today.

Figure 2 compares the economic growth rate of China to that of G7 countries. In 1978, China accounted for only 1.8 percent of global GDP, which was lower than that of the lowest ranking G7 country, Canada. In 2016, this figure had expanded to 14.8 percent, accounting for 1/7 of the world total, and China became the second largest country in the world, with the USA being the largest.

Similar results can be observed for trade volume (Figure 3). China's share in global trade jumped from 0.5 percent in 1978 to 10.1 percent in 2016. Its global ranking has also risen steadily. In 2016, China became the second largest trading country, outperforming all G7 countries except the USA.

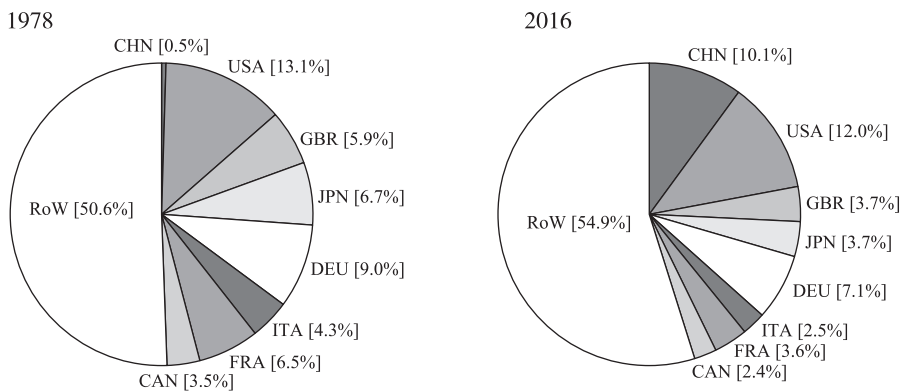
Figure 2. Composition of World GDP, 1978 and 2016



Source: The World Bank, World Development Indicators.

Notes: CAN, Canada; CHN, China; DEU, Germany; FRA, France; GBR, United Kingdom; ITA, Italy; JPN, Japan; RoW, Rest of World; USA, United States.

Figure 3. Composition of Global Trade, 1978 and 2016



Source: The World Bank, World Development Indicators.

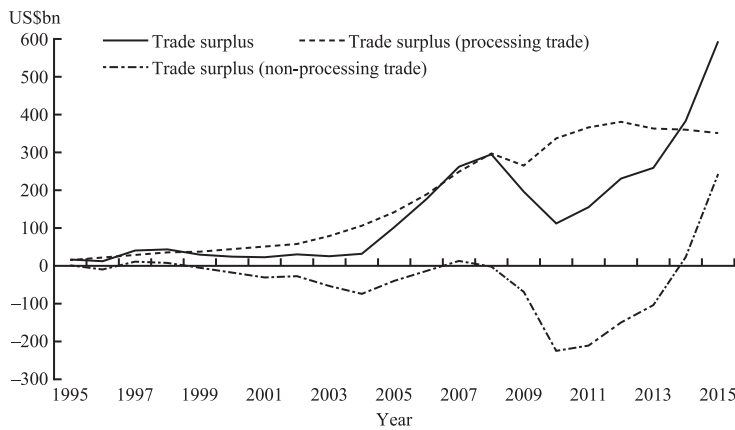
Notes: CAN, Canada; CHN, China; DEU, Germany; FRA, France; GBR, United Kingdom; ITA, Italy; JPN, Japan; RoW, Rest of World; USA, United States.

2. Downfall of Processing Trade

After adopting the opening-up policy, China exploited the advantages of low labor

costs and preferential tax policies to engage in processing trade, which provided China the opportunity to participate in international trade and production. At the same time, this also alleviated the shortage of domestic savings and foreign exchange in the early opening-up period. As shown in Figure 4, from 1995 to 2013, nearly all of China's trade surplus was from processing trade, while the non-processing trade has been in deficit except for the year 2007.

Figure 4. China's Trade Surplus, 1995–2015

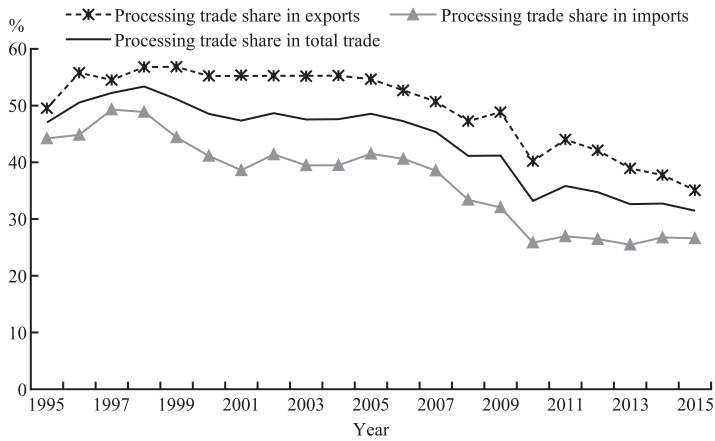


Source: Authors' calculation from Chinese Customs data.

This situation has significantly changed over the past decade. The non-processing trade deficit started to decrease in 2010 and turned into a trade surplus in 2014. In contrast, processing trade's surplus reached its peak in 2012 and then started to decrease. In late 2015, processing trade and non-processing trade made a similar contribution to the total trade surplus. It can be expected that in future years, non-processing trade will take the place of processing trade to become the major source of China's trade surplus.

Figure 5 shows the continuous decline of processing trade. China's processing trade share in total exports appeared to decrease after 1998 and reached 31.5 percent in 2015. The downward trend of China's processing trade can also be observed on the import side.

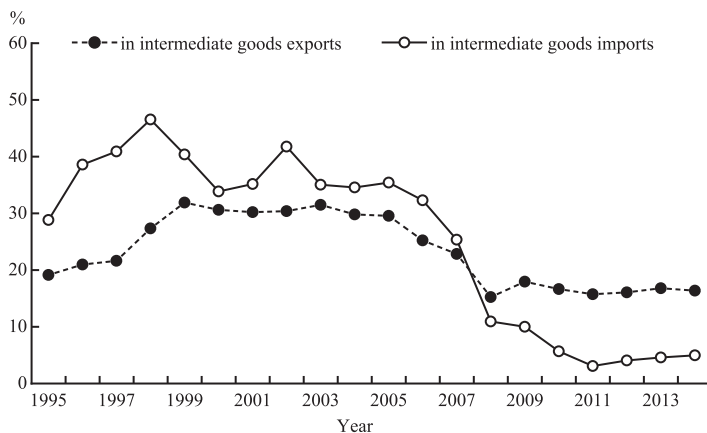
Figure 5. Processing Trade Share, 1995–2015



Source: Authors' calculation from Chinese Customs data.

Moreover, not only was there a decline of processing trade in gross trade, but a similar phenomenon existed in intermediate goods trade, which is closely linked to international production sharing. As shown in Figure 6, the share of processing trade in China's intermediate goods trade started to decrease from 1998 or 1999, and this trend was reflected especially in imports.

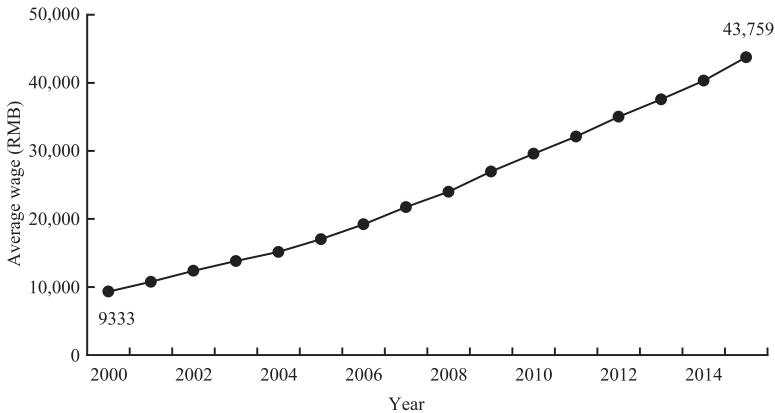
Figure 6. Share of Processing Trade in Intermediate Goods Imports/Exports, 1995–2014



Source: Authors' calculation from OECD Inter-country Input–Output Tables.

What are the reasons for the rapid decline in processing trade? Processing trade is highly sensitive to labor costs. As shown in Figure 7, the average annual income of China's urban residents was over RMB40,000 in 2015, which was almost five times that in 2000.

Figure 7. Average Wage of Employed Persons in Urban Units of China, 2000–2015
(in RMB, Deflated by Consumer Price Index, Year 2000 = 100)

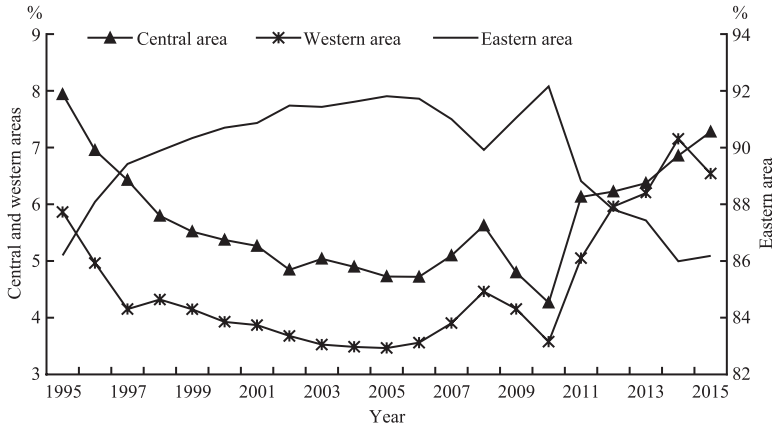


Source: National Bureau of Statistics Database.

Facing rapidly increasing labor costs, suppliers have two choices. The first option is to relocate to another country with advantageous labor costs, such as Vietnam, Laos or Thailand. The second option is to relocate from eastern coastal areas to the central and western areas of China where labor costs are relatively low. The first option could result in the decline of processing trade volume and the second option could change the regional distribution of processing trade in China.

Through examining the regional composition of processing trade in eastern, central and western areas (Figure 8), it is evident that relocation to inland areas, indeed, occurred and at significant scale, after 2010. The share of processing trade in the eastern area decreased from 92.2 percent in 2010 to 86.2 percent in 2015. The annual decline was over 1 percent. In contrast, the share of processing trade in central and western regions increased from 2010.

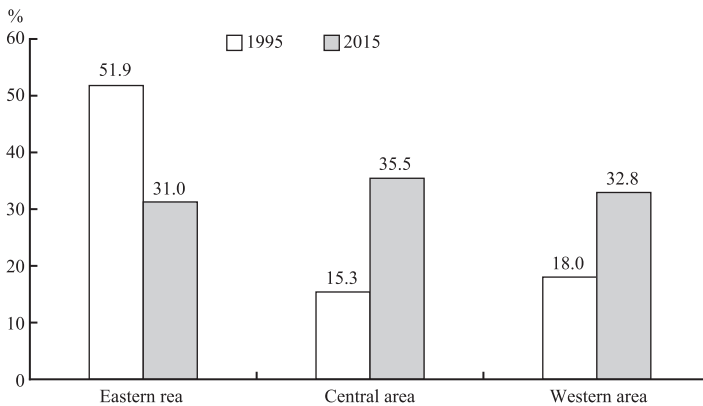
Figure 8. Regional Composition of Trade, 1995–2015



Source: Authors' calculation based on Chinese Customs data.

As for the share of processing trade in total trade, the trend of change in the eastern area is exactly the opposite of that in the central and western areas. As shown in Figure 9, in the eastern area, the share of processing trade has decreased nearly 20 percentage points since 1995. At the same time, contrary to the eastern area, the shares of processing trade for central and western regions have shown large increases.

Figure 9. Share of Processing Trade in Total Trade, Regional Level, 1995 and 2015



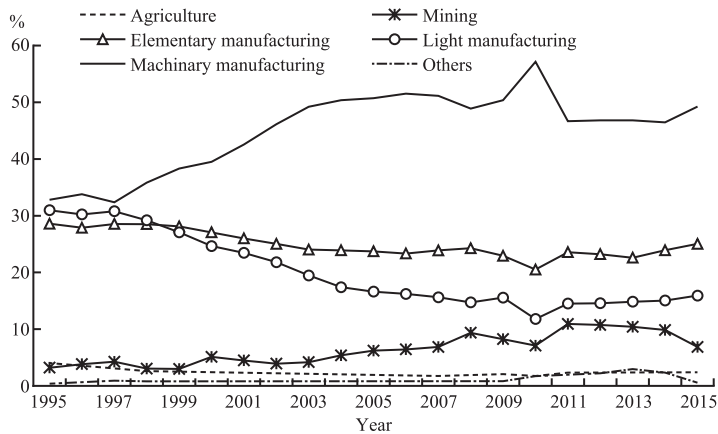
Source: Authors' calculation from Chinese Customs Data.

3. Upgrading of Trade Structure

With the shrinking share of processing trade, China's foreign trade structure, especially the manufacturing trade structure, has changed rapidly. China is transforming from being a world assembly line to a world manufacturing powerhouse.

As shown in Figure 10, almost synchronized with the turning point of the development of processing trade, the share of machinery manufacturing goods in total trade has been increasing since 1997, and reached the peak share of 57 percent in 2010, then remained stable at 47 to 50 percent after a downward adjustment. Over the past 18 years, almost 17 percent of the foreign trade volume has shifted from elementary manufacturing and light manufacturing to machinery manufacturing goods. China's foreign trade has progressed from being labor intensive to being capital and technology intensive, and from primary manufacturing to high-end manufacturing. Similar findings are reported in Ju and Yu (2015). Their research also shows that China's export structure has undergone tremendous changes since 2002. The decreases in export shares are observed in consumption goods industries, such as textiles, leather products and toys, while the increases have mainly occurred in midstream high-technology industries.

Figure 10. Structural Changes in Trade, 1995–2015



Source: Authors' calculation from Chinese Customs data.

Table 1 lists the Chinese sectors with a more than 1-percentage-point change in their share of total exports and total imports during the past 20 years. For imports and exports, the share increase in “computer, electronic and optical products” always ranked the highest; “motor vehicles” also shows a large increase. The machinery and equipment sector has shifted from being a large import sector to being a large export sector.

However, in the sector of wearing apparel, beverages and other light manufacturing sectors, the trade share contracted sharply. In addition, to fulfill the growing energy demand, the imports of oil and gas have increased significantly.

Table 1. Sectors with the Largest Increase/Decrease in Share of Total Exports (a) and Total Imports (b) from 1995 to 2015 (%)

(a)				
	Sector (ISIC rev. 4, 2 digit)	1995	2015	Change
1	Computer, electronic and optical products	12.9	29.5	16.6
2	Machinery and equipment	3.0	7.3	4.3
3	Electrical equipment	6.1	9.4	3.3
4	Furniture	0.8	2.4	1.6
5	Motor vehicles	1.3	2.8	1.5
6	Other transport equipment	1.6	2.6	1.0
1	Wearing apparel	16.0	7.5	-8.5
2	Textiles	10.0	4.9	-5.1
3	Beverages	5.3	2.1	-3.2
4	Leather products	6.8	3.7	-3.1
5	Other manufacturing	6.7	4.4	-2.2
6	Crop and hunting	2.6	0.7	-1.9
7	Crude petroleum and natural gas	1.5	0.1	-1.4
(b)				
	Sector (ISIC rev. 4, 2 digit)	1995	2015	Change
1	Computer, electronic and optical products	14.6	29.2	14.6
2	Crude petroleum and natural gas	1.8	9.1	7.3
3	Mining of metal ores	1.5	5.6	4.1
4	Motor vehicles	2.2	4.5	2.3
1	Machinery and equipment	17.9	6.2	-11.7
2	Textiles	8.1	1.1	-7.0
3	Chemical products	14.1	8.9	-5.1
4	Food products	4.3	2.4	-1.9
5	Fabricated metal products	2.4	1.0	-1.4
6	Leather products	1.8	0.6	-1.2
7	Paper products	2.4	1.4	-1.0

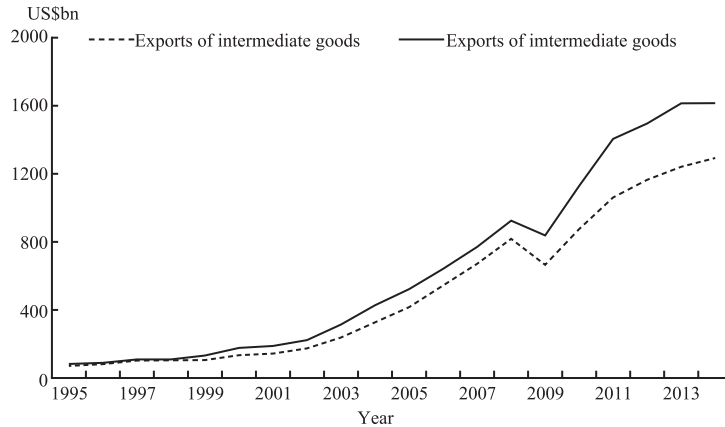
Source: Authors' calculation from Chinese Customs data.

4. International Production Sharing

Cross-border production sharing along the global value chain has become a key feature of economic development, with the share of intermediate goods in global trade constantly increasing. To maximize production efficiency, participants in the global value chain connect with each other through cross-border flows of intermediate goods and benefit from economic cooperation.

As shown in Figure 11, synchronized with the growth of gross trade, China's intermediate goods trade appears to have been fast growing. However, different from the long-term trade surplus of total trade, the trade of intermediate goods has always run a trade deficit.

Figure 11. China's Intermediate Goods Trade, 1995–2014



Source: Authors' calculation from OECD Inter-country Input–Output Tables.

However, the growth of China's intermediate goods trade was always faster than the growth of total trade (Figure 12), which means that, compared with traditional goods trade, intermediate goods trade under the global value chains contributes more to China's trade growth.

As shown in Figure 13, comparing the top three countries (Germany, Japan and the USA) for trade in intermediate goods, China's imports and exports of intermediate goods have demonstrated a much higher growth rate. The share of China's intermediate goods exports in the world total has reached 10 percent and the share of intermediate goods imports in the world total was as high as 12.5 percent, almost the same as for the USA, which implies that China has become the most important player in global production.

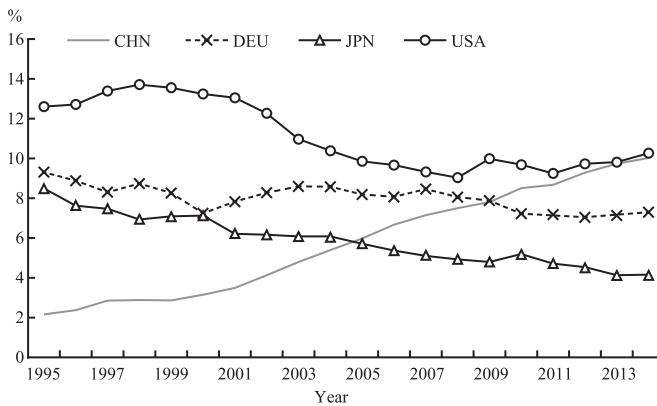
Figure 12. Share of Intermediate Goods in Gross Exports and Gross Imports, 1995–2014



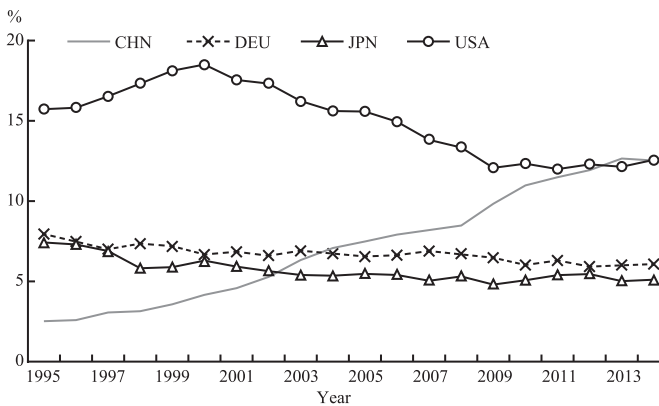
Source: Authors' calculation from OECD Inter-country Input–Output Tables.

Figure 13. Country Share in Global Intermediate Goods Trade, 1995–2014:
(a) by exports and (b) by imports

(a)



(b)

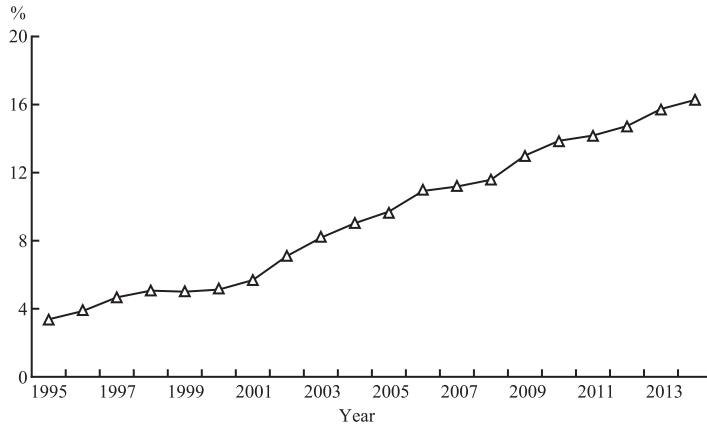


Source: Authors' calculation from OECD Inter-country Input–Output Tables.

Notes: CHN, China; DEU, Germany; JPN, Japan; USA, United States.

Specifically looking at the US–China production linkage, Figure 14 shows that the share of US-imported intermediate goods from China is increasing rapidly.

Figure 14. Share of US Imported Intermediate Goods from China, 1995–2014



Source: Authors' calculation from OECD Inter-country Input–Output Tables.

In 2014, as shown in Table 2, the share of US-imported intermediate goods from China reached 16.3 percent, which is next to Canada as the largest source of foreign intermediate goods provided to the USA. Back in 1995, China's share was merely 3.4 percent and its ranking were far behind Japan, as well as other new East Asian economies, such as Korea and Chinese Taiwan.

Table 2. Top 10 Sources of US Intermediate Goods Imports, 1995 and 2014 (%)

	Source	1995		Source	2014
1	CAN	17.6	1	CAN	16.8
2	JPN	17.0	2	CHN	16.3
3	MEX	7.6	3	MEX	10.2
4	DEU	5.5	5	JPN	5.3
5	GBR	5.1	6	DEU	4.9
6	KOR	3.9	7	GBR	4.6
7	TWN	3.9	8	SAU	2.9
8	CHN	3.4	9	KOR	2.7
9	ITA	2.7	10	FRA	2.1
10	FRA	2.7	10	IND	2.0

Source: Authors' calculation from OECD Inter-country Input–Output Tables.

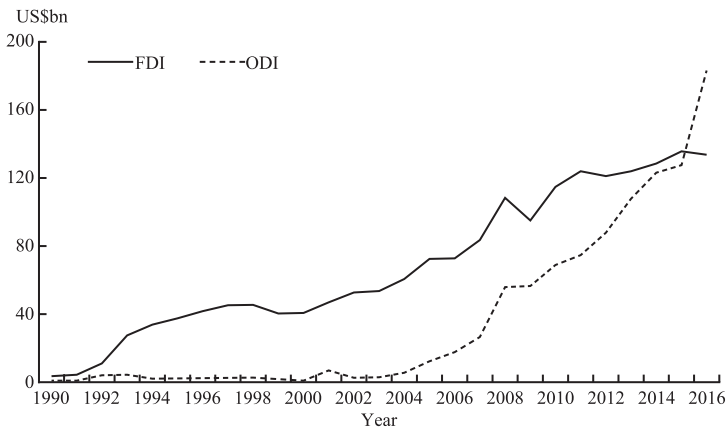
Notes: CAN, Canada; CHN, China; DEU, Germany; FTA, France; GBR, United Kingdom; IND, India; ITA, Italy; JPN, Japan; KOR, Korea; MEX, Mexico; SAU, Saudi Arabia; TWN, Chinese Taiwan.

To sum up, with the dual effects of increased labor costs and changes in trade policy, over the past 20 years, China’s foreign trade structure has changed substantially, shifting from processing to machinery manufacturing.

III. From a World Capital Receiver to a World Investor

The “growth miracle” of China is not only reflected in the high growth rate of international trade but also in the fastest growing level of FDI inflows and outflows. From the perspective of capital flow, China shifted its role from being a capital receiver to a capital investor, and realized net capital outflow in 2016. As shown in Figure 15, the development of China’s foreign investment had a late start. Foreign investment started to grow rapidly around 2002. Compared with the fast growth of FDI commencing around 1992, the development of outward direct investment (ODI) was nearly 10 years behind. However, the speed of the ODI growth after 2002 was much higher than that of FDI growth. It took only 15 years for ODI to catch up with FDI.

Figure 15. China’s Foreign Direct Investment (FDI) and Outward Direct Investment (ODI) Flows, 1990–2016



Source: UNCTAD (2017).

Table 3 lists the 3 economies with the largest FDI inflow and outflow (and Chinese mainland). The table shows that China’s share of the global FDI flow continues to rise. In 1990, China’s FDI inflow was not included among the world’s top 10 countries for FDI inflow, but in 2016, it ranked 3rd in the world. What is even more interesting is that

China's FDI outflow started to grow later but grew much faster than its FDI inflow. In 2000, China's FDI outflow ranked only 33th in the world, but in 2016, it moved to 2nd place in the world.

Table 3. Top 3 Economies of Foreign Direct Investment (FDI) Inflows and Outflows

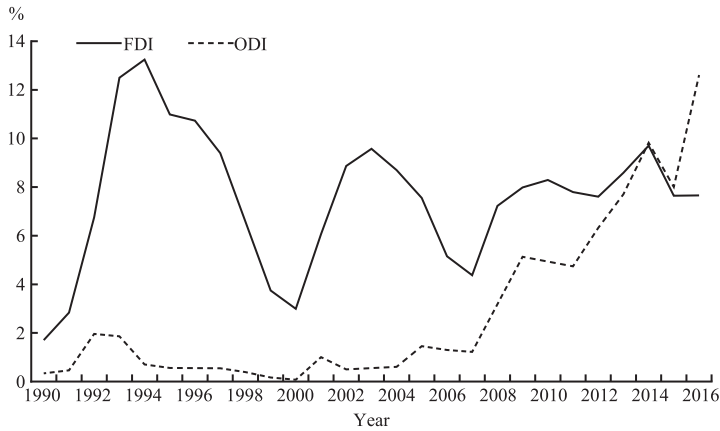
	FDI inflow			FDI outflow		
		Country	% of world total		Country	% of world total
1990	1	USA	23.6	1	Japan	20.8
	2	UK	14.9	2	France	15.7
	3	France	8.1	3	USA	12.7
	11	Chinese mainland	1.7	21	Chinese mainland	0.3
2000	1	USA	23.1	1	UK	1.5
	2	Germany	14.6	2	France	3.3
	3	UK	8.5	3	USA	2.7
	7	Chinese mainland	3.0	33	Chinese mainland	0.1
2010	1	USA	14.3	1	USA	20.0
	2	Chinese mainland	8.3	2	Germany	9.1
	3	Brazil	6.1	3	Chinese Hong Kong	6.2
				5	Chinese mainland	5.0
2016	1	USA	22.4	1	USA	20.6
	2	UK	14.5	2	Chinese mainland	12.6
	3	Chinese mainland	7.7	3	Netherlands	12.0

Sources: UNCTAD (2017) and authors' calculation.

As shown in Figure 16, China's FDI inflow share reached a peak in 1994 and experienced a rapid downfall during the Asian financial crisis. A rebound occurred after the crisis and the share has remained around 8 percent. However, the growth pattern of China's FDI outflow has been significantly different. Since joining the WTO in 2001, China's FDI outflow share has increased rapidly, with little downward fluctuation.

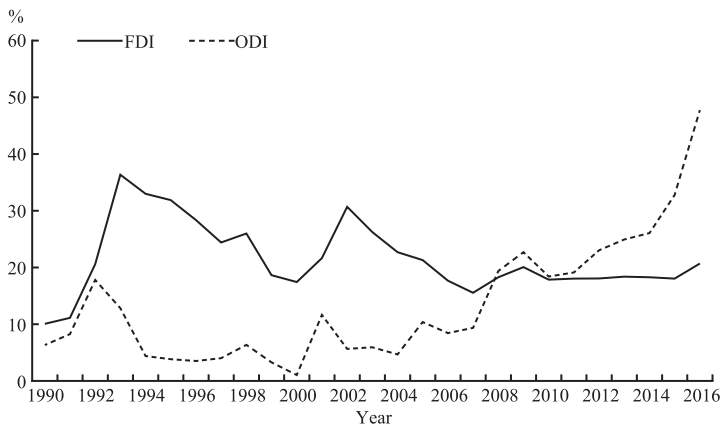
China's FDI flows are greater than those of other developing countries. As shown in Figure 17, China accounted for 20 percent of developing countries' total FDI inflow. This share has remained relatively stable since the 1990s. Regarding the FDI outflow, China's relative importance has increased sharply in the past 10 years. In 2016, China's FDI outflow accounted for nearly half of the FDI outflow of developing countries.

Figure 16. China's Foreign Direct Investment (FDI) and Outward Direct Investment (ODI) Flows, 1990-2016 (% of World Total)



Sources: UNCTAD (2017) and authors' calculation.

Figure 17. China's Foreign Direct Investment (FDI) and Outward Direct Investment (ODI) Flows, 1990-2016 (% of Developing Countries' Total)



Sources: UNCTAD (2017) and authors' calculation.

Table 4 reports the evidence at the firm level. For the top 100 non-financial multinational enterprises from developing and transition economies, 37 Chinese companies are listed, among which 17 are from Chinese mainland, 14 from Chinese Hong Kong and 6 from Chinese Taiwan.

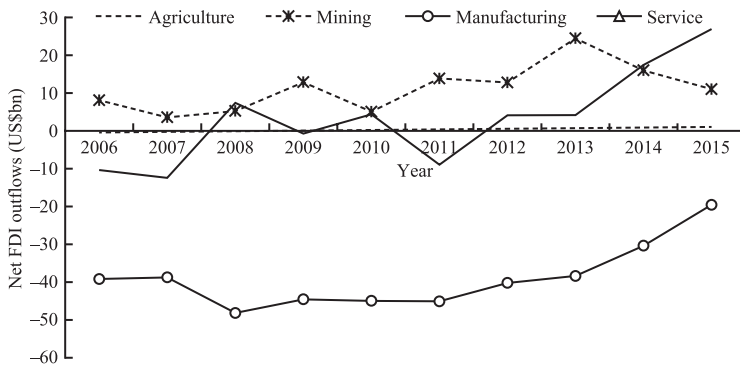
Table 4. Number of Non-financial Multinational Enterprises Ranked among the Top 100 from Developing and Transition Economies, Ranked by Foreign Assets, 2015

	Mining and agriculture	Manufacturing	Service	Total
Chinese mainland	4	5	8	17
Chinese Hong Kong	1	1	12	14
Chinese Taiwan	0	6	0	6
Total	5	12	20	37

Sources: UNCTAD (2017) and authors' calculation.

The trend of change from capital receiver to capital investor occurred in almost every sector. As shown in Figure 18, net FDI outflows increased in agriculture, mining, manufacturing and services. Among the four sectors, FDI outflows from service and manufacturing sectors rose at the fastest pace. The mining sector maintained long-term net capital outflow. The service sector and the agriculture sector realized their reversal from net capital inflow to net outflow in 2012 and 2013, respectively. In 2015, the manufacturing sector was still at the stage of net capital inflow, but the gap between ODI and FDI was narrowing rapidly. In the near future, there is no doubt that the manufacturing sector could realize net capital outflow.

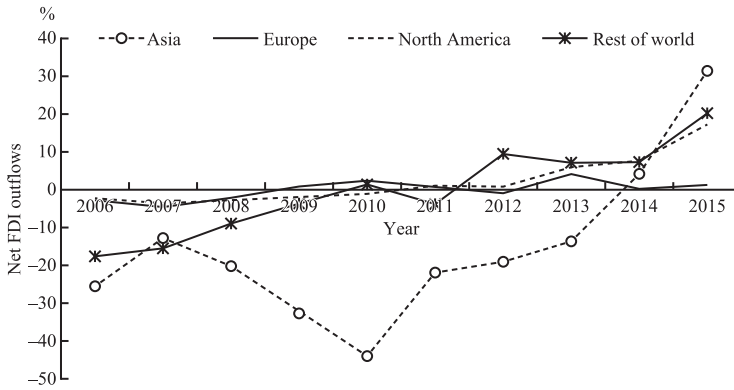
Figure 18. Net Foreign Direct Investment (FDI) Outflows (FDI Outflows Less FDI Inflows, US\$bn), by Sector, 2006–2015



Source: National Bureau of Statistics Database.

From the viewpoint of four different regions around the globe (Asia, Europe, USA and Rest of World), Figure 19 shows that China today has already realized net FDI outflow in all regions. In 2016, Asia became the largest destination for China's net FDI outflow.

Figure 19. Net Foreign Direct Investment (FDI) Outflows
(FDI Outflows Less FDI Inflows, US\$bn), by Destination, 2007–2016



Source: UNCTAD, Bilateral FDI Statistics.

With the shift in its role from capital receiver to capital investor, China's outward investment became an indispensable capital source in the world market. Meanwhile, the high-speed growth of China's foreign investment was continuing.

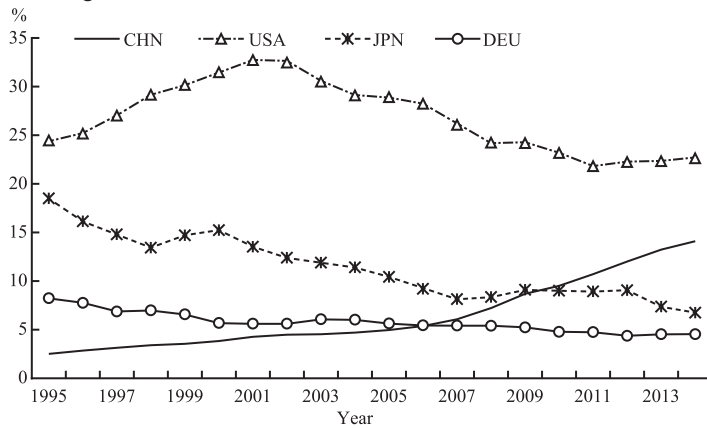
IV. From the World Factory to the World Market

In addition to the expansion of production, China's consumption is also gradually becoming among the largest worldwide, providing strong support to foster the world's economic growth from the demand side.

As shown in Figure 20, the USA was the largest consumption market throughout the sample period, followed by Japan and Germany. In 1995, the USA, Japan and Germany accounted for half of the world consumption. However, the rise of China's share in consumption was astonishing, surpassing Germany's in 2007 and Japan's in 2010, and becoming the second largest consuming country. The gap between China and the USA has been steadily shrinking since 2001. China has the potential to be the largest market for consumption in the near future.

When looking at different sectors (Table 5), by the end of 2014, China was ranked as the first in the world for consumption of agriculture, mining, light manufacturing and machinery manufacturing products. China's consumption of service and elementary manufacturing products was next to the USA, ranking as the second in the world.

Figure 20. Who Consumes the Most in the World? 1995–2014



Source: Authors' calculation from OECD Inter-country Input–Output Tables.

Notes: CHN, China; DEU, Germany; JPN, Japan; USA, United States.

Table 5. Who Consumes the Most in the World?
(2014, by Sector, % in World's Total Consumption)

Agriculture			Mining			Service		
1	CHN	26.6	1	CHN	12	1	USA	25.1
2	IND	11.1	2	MEX	9	2	CHN	12.1
3	USA	4.1	3	NOR	7	3	JPN	7.1
4	RUS	3.7	4	USA	7	4	DEU	4.5
5	IDN	3.1	5	CAN	4	5	GBR	4.1
Manufacturing								
Elementary manufacturing			Light manufacturing			Machinery manufacturing		
1	USA	23	1	CHN	17.9	1	CHN	26.3
2	CHN	8	2	USA	16.9	2	USA	14.6
3	DEU	6	3	JPN	5.5	3	JPN	7.3
4	IND	6	4	DEU	4.5	4	DEU	5.3
5	JPN	5	5	GBR	3.3	5	BRA	2.9

Source: Authors' calculation from OECD Inter-country Input–Output (ICIO) Tables.

Notes: BRA, Brazil; CAN, Canada; CHN, China; DEU, Germany; GBR, United Kingdom; IDN, India; JPN, Japan; MEX, Mexico; NOR, Norway; RUS, Russia; USA, United States.

Table 6 shows that, among the 63 economies (other than China) covered in the OECD Inter-country Input–Output (ICIO) Database,³ Australia, Korea and 6 other economies counted Chinese mainland as their largest overseas market in 2014. Brazil, Argentina and the rest of the 17 economies counted Chinese mainland as their 2nd or 3rd largest overseas market. Comparing this to 2005, only 7 economies counted Chinese mainland as among the top 3 overseas market. Early in 1995, only Chinese Hong Kong and Chinese Taiwan and Chinese mainland were listed.

³Rest of World was considered an economy on its own.

Table 6. Who Relies on the Consumption Market in China?

			1995	2005	2014
Chinese mainland is the	Largest	Overseas market for	Chinese Hong Kong	Chinese Hong Kong	Australia, Korea, Malaysia, Thailand, Chinese Hong Kong and Chinese Taiwan
	Second largest	Overseas market for	—	Japan, Korea, Malaysia and Chinese Taiwan	Brazil, Costa Rica, Indonesia, Japan, Peru, Philippines, Singapore, Viet Nam, South Africa and Rest of World
	Third largest	Overseas market for	Chinese Taiwan	Australia and Philippines	Argentina, Canada, Chile, Israel, New Zealand, Russia and Saudi Arabia

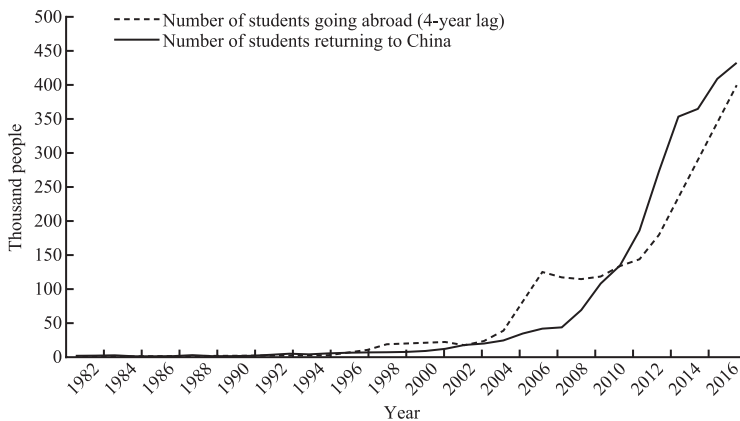
Source: Authors' calculation from OECD Inter-country Input–Output Tables.

V. From Made in China to Innovated in China

With the dual pressure from population structural change and the rise of labor costs, China's economy has reached a key turning point. Whether China could successfully switch its position from “made in China” to “innovated in China” will determine the sustainable growth rate of production, investment and consumption.

What requires attention, besides the turning point of production, investment and consumption, is the turning point between “brain drain” and “brain gain.” Comparing the number of students going abroad and overseas students returning to China (Figure 21), the number of overseas returnees increased significantly faster after the global financial crisis. Given the assumption that the average duration of studying abroad is 4 years, China has already entered the stage of “brain gain.”

Figure 21. Number of Students Going Abroad and Returning to China, 1982–2016



Source: National Bureau of Statistics Database.

When looking at other technology innovation indicators, Wei et al. (2017) point out that, for China's above-scale manufacturing firms, a large proportion of their technology improvement budget was shifting from importing and digesting foreign technologies to technologies from other domestic firms or financing independent R&D activities. In the meantime, China's growing R&D share in GDP, share of researchers in the population and number of patents, have all contributed to the improvement of China's innovation.

The return of overseas talent and the large investment in R&D had great impacts on China's technological development. According to the trade data shown in Figure 22, the share of high-technology products in trade has improved significantly in the past 20 years. By 2015, shares of high-technology imports and exports had improved, from 12.8 and 3.9 percent to 45.3 and 30.2 percent, respectively.

Figure 22. Share of High-technology Goods in Manufacturing Trade, 1985–2015



Source: National Bureau of Statistics Database.

VI. China's Role in the Global Economic System

With the rapid rise of China and other emerging economies in Asia, as well as the establishment and development of the European Union, the global economic governance system has also reached a turning point. The old global economic system, which was dominated by the USA, has been replaced by a block-structured tri-polar world order including North American, Europe and Asian, which, respectively, consider the USA, Germany and China as the core.

This section will continue to focus on trade, foreign investment and global

production sharing, break down the structure of trade, capital and intermediate goods flows, and investigate the role China played in establishing this regionalized world economic system.

1. China's Role in International Trade

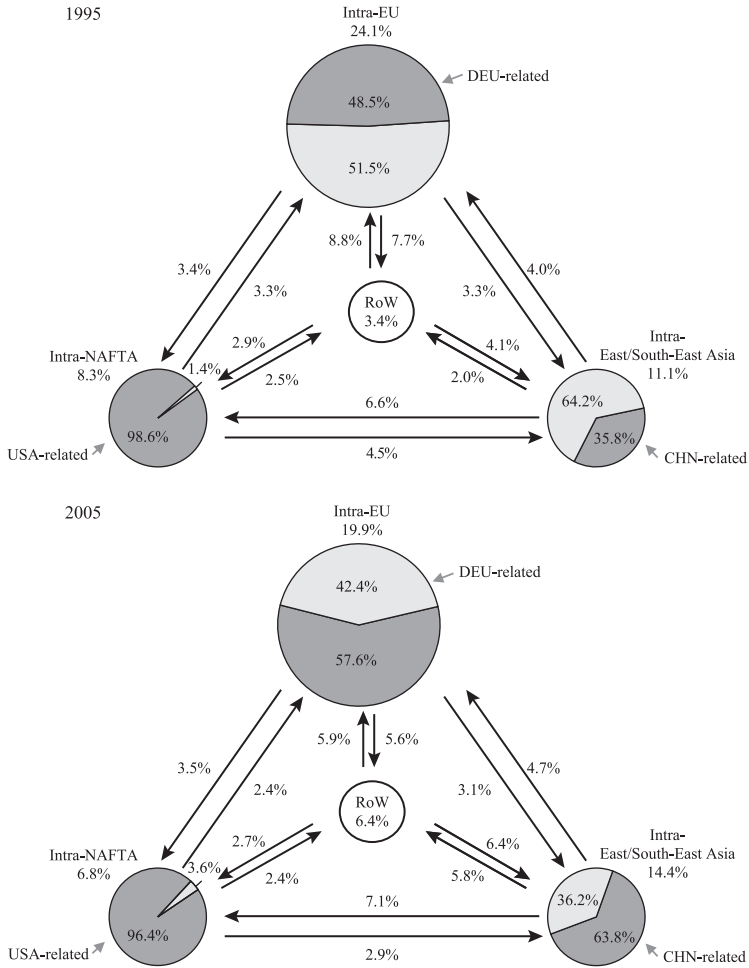
Figure 23 shows the global trade structure in 1995 and 2015 (bilateral trade measured on import side). The three circles in the figure symbolize intra-EU, intra-NAFTA and intra-East/South-East Asia, respectively. A larger area reflects the higher volume of intra-regional trade. The darker shaded area in the circle and the number indicate the share of Germany-related, Japan-related or China-related trade in intra-regional trade. Taking the EU as an example, Germany-related trade is the sum of Germany's imports and exports from/to other EU countries. The circle in the center symbolizes the internal trade in the rest of world. Lines connecting areas represent trade among regions. Arrows point to importers. The numbers marked on lines are the share of trade in this direction as a percentage of total trade. This figure provides a complete breakdown of global trade, so the sum of share of intra-regional and inter-regional trade is 100 percent.

When comparing the trade structure of 1995 and 2015, we find the following:

First, the intra-East/South-East Asia trade share appeared to be expanded while the intra-EU and intra-NAFTA trade share was reduced. Second, the internal trade within each of the three major regions accounted for a significant proportion of international trade. In 1995 and 2015, the share of the three regions' total internal trade in global trade was 43.5 and 41.1 percent, respectively (Figure 23). Third, each block has a core economy. The EU and NAFTA have Germany and the USA as their cores, respectively. For East/South-East Asia, Japan was the core country in 1995.⁴ However, by 2015, China replaced Japan to be the core economy of East/South-East Asia. Finally, looking from the aspect of inter-regional trade, East/South-East Asia's exports to North America and the EU's trade with the rest of the world were both large. In addition, trade between East/South-East Asia and the rest of the world shows a large increase in the past 20 years. Overall, a block-structured tri-polar world order including North America, Europe and Asia, respectively, with the USA, Germany and China at the core, has already formed.

⁴According to our calculation, in 1995, Japan-related trade accounted for 74.5 percent of East/South-East Asia's internal trade, surpassing China-related trade which only accounted for 35.8 percent.

Figure 23. Global Trade Structure, 1995 and 2015



Source: Authors' calculation from UN COMTRADE Database.

Notes: CHN, China; DEU, Germany; EU, European Union; NAFTA, North American Free Trade Agreement; RoW, Rest of World; USA, United States.

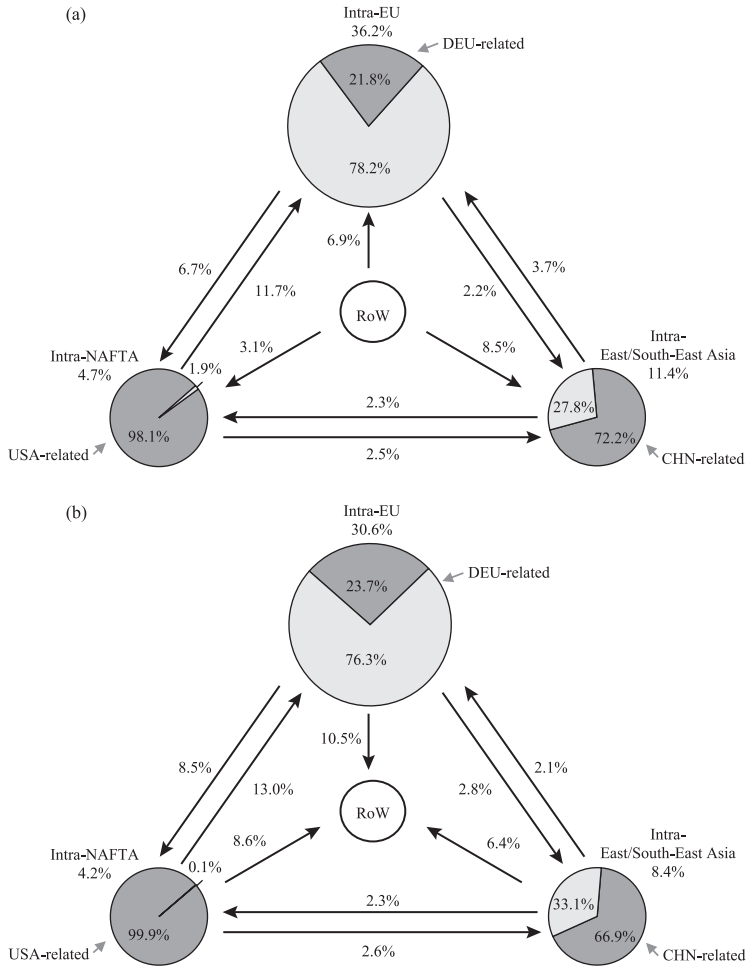
2. China's Role in International Investment

From the perspective of the global investment network, the same tri-polar world order with core countries can also be observed. Figure 24 presents the sources and destinations of FDI inflow and outflow stock for the NAFTA, the EU and East/South-East Asia in 2015.

Again, we have observed that German-related, US-related and China-related FDI stock all accounted for high shares within the regions. The sum of internal investment of the three regions accounted for 52.3 percent of global FDI instock and 43.4 percent

of out stock. Besides this, the NAFTA and the EU have a close bilateral investment relationship if we look at inter-regional investment.

Figure 24. Foreign Direct Investment (a) Instock and (b) Outstock Structure for the NAFTA, the EU and East/South-East Asia, 2012



Sources: UNCTAD, Bilateral FDI Statistics and authors' calculation.

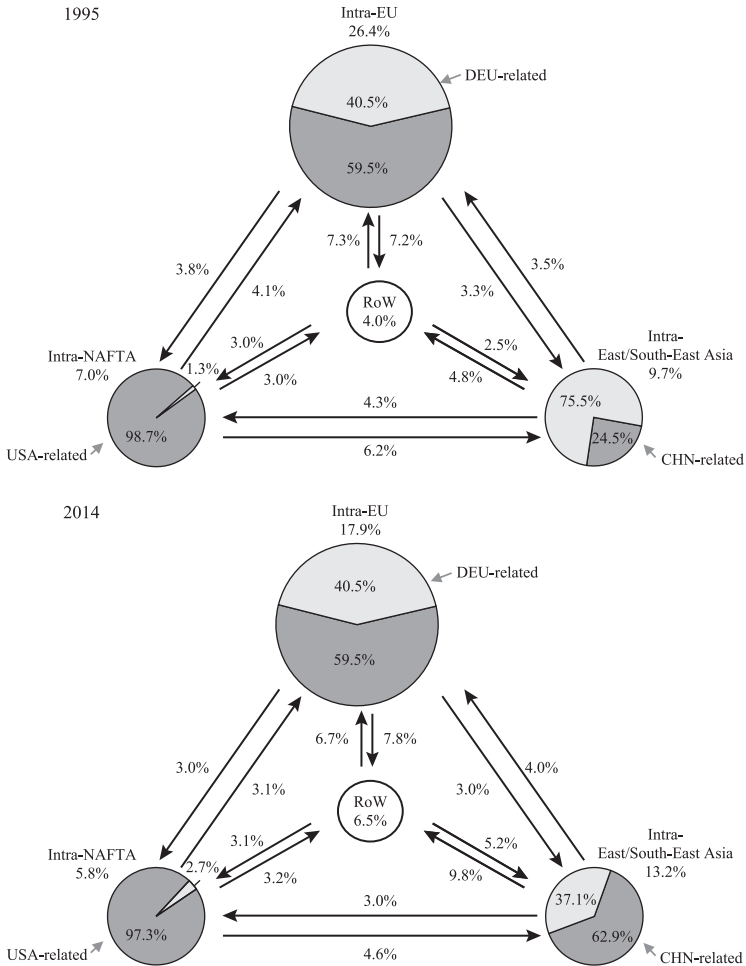
Notes: CHN, China; DEU, Germany; EU, European Union; NAFTA, North American Free Trade Agreement; RoW, Rest of World; USA, United States.

3. China's Role in International Production Sharing

Under the international production sharing network represented as cross-country

intermediate goods flows (Figure 25), a block-structured tri-polar world order can also be observed. Similar to the trade structure, in the past 20 years, the share of intra-EU and intra-NAFTA intermediate goods trade fell while the share of intra-East/South-East Asia increased significantly. In 1995, the share of China-related intermediate goods trade was only 24.5 percent. However, in 2015, China-related intermediate goods trade share climbed to 62.9 percent, consolidating its core position in international production sharing.

Figure 25. Global Production Sharing Structure, 1995 and 2014



Source: Authors' calculation from OECD Inter-country Input-Output Tables.

Notes: CHN, China; DEU, Germany; EU, European Union; NAFTA, North American Free Trade Agreement; RoW, Rest of World; USA, United States.

In summary, the tri-polar world order can be clearly observed from all three aspects, including trade, foreign investment and global production sharing.

VII. Conclusion

The present paper, focusing on global trade, foreign investment and the Inter-country Input–Output Tables, systematically reviews the growth miracle of China since adopting the opening-up policy, and points out four major changes in China’s economic role.

Our analysis shows that, after experiencing 40 years of high-speed economic development, China has shifted from being a country of trade to a major producer, capital investor, consumer and innovator. From the supply side, China’s production structure is changing from being labor-intensive to technology and capital-intensive, from low-end manufacturing to middle-end and high-end manufacturing. At the same time, when China became a net capital exporter, its ability to utilize global resources greatly improved and China became an important part of the global production chain. From the demand side, China has become the second largest consumption market next to the USA and still has large space to grow in the future.

With the fast expansion of the global value chain, China not only fostered the flow of value-added along the value chain as a large country of trade but also efficiently allocated global resources and participated in the value chain as a large producer, capital investor and innovator. Then from the demand side, China as a big consumer, provided strong support to the world economic growth from the demand side.

Following its growth miracle, China, together with the USA and German, formed the core countries in the tri-polar world order including North America, Europe and Asia. However, in-depth regional cooperation agreements such as NAFTA and EU, have not been established in Asia yet. China, as the core economy in Asia, should carefully consider and lead the establishment of in-depth free trade areas to promote the fast and efficient development of regional economic cooperation. Following its economic rise, while enjoying the fruits of economic growth, China should also prepare to take greater responsibility in the global economic governance system.

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