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South-South Integration and the SDGs:
Enhancing Structural Transformation in Key Partner Countries of the Belt and Road Initiative

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Strengthen the structural transformation of the Belt and Road partner countries: Global value chain integration and upgrade

Abstract: Since the reform and opening up, China has made remarkable economic achievements through its deep participation in global value chains. At present, with the strengthening of regional value chains, the *Belt and Road Initiative* also provides new opportunities for partner countries to realize structural transformation. This paper reviews the four main development stages of China's processing trade, as well as China's strategies and measures to promote foreign trade, FDI and industrial innovation. Besides, this paper analyzes the important experience of China's participation in GVCs from different aspects, including appropriate gradual opening strategy, the combination of *bring in* and *go out,* making full use of demographic dividend, accelerating the process of industrialization, and attaching importance to infrastructure construction as well as innovation capacity. On this basis, combined with the actual situation of *Belt and Road* partner countries, this paper provides some suggestions for them to realize their own development through globalization process.

Key words: GVC, B&R

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Introduction

With the increasing development of economic globalization, the production system has been subdivided into different processes and modules, reshaping the world economic landscape and mode of operation.

In this process, the "One Belt, One Road" initiative has enriched the concept of international economic cooperation and the connotation of multilateralism, and has provided a strong impetus to promote the growth of the world economy in the past six years, the deep integration and development of global value chains and supply chains, and the inclusive and sustainable development of related economies. Quality and efficiency enhancement as well as the transformation and upgrading of countries along the Belt and Road have provided strong impetus.

China should be committed to building an open and inclusive, resilient "Belt and Road" value chain, deeply participate in the international division of labor, and vigorously develop new infrastructure, service trade, science and technology innovation and other industries to promote high-quality openness and development.

1. Global value chain upgrade provides new opportunities for the structural transformation of the Belt and Road partner countries

Since the global financial crisis in 2008, the international economic power has undergone significant changes. At the same time, the reconstruction of global value chains has accelerated under the new round of scientific and technological revolution. The regional value chains are strengthening. The Belt and Road Initiative provides conditions and opportunities for establishing new supply chains and regional value chains. In particular, under the BRI, a new supply chain and production network system will be formed with enterprises from China and other developing countries. The reconstruction of global value chain provides an opportunity for developing countries to integrate into the international division of labor system or upgrade the global value chain.

1.1 A new round of scientific and technological revolution is reshaping the GVCs

The global value chain has brought the economies of the world more closely, creating huge flows of goods, information and capital. Their rapid development has changed the world economic structure as well as trade, investment and production relations among countries.

After the financial crisis in 2008, the rapid rise of emerging economies and developing countries and the deepening of regional cooperation have stimulated their market development potential and expanded the scale of local demand. At the same time, the Reverse Innovation of multinational companies, the Manufacturing Re-flux measures of developed countries and rapid arrival of the fourth industrial revolution characterized by the widespread application of new generation of information technology have promoted the reshaping of GVCs. According to the “Global Value Chain Development Report” published by the WTO and the OECD, the new round of scientific and technological revolution will transform the traditional global production mode and service format, break the original large-scale and standardized production mode and promote the shift of international division of labor from the value chain division to network division. It will promote the integration of manufacturing and service industries in the industrial chain, and promote the decomposition, integration and innovation of GVCs.

At the same time, trade protectionism initiated by developed countries has impacted the global value chain on the one hand, and on the other hand, has strengthened China's national value chain. Trade protectionism is accelerating the transfer of labor-intensive and resource-intensive production to South Asia, Southeast Asia, Africa and other regions. Some production process with higher capital and technology content may be transferred to Japan, South Korea, Europe and other countries or regions, and even return to the United States (such as Oracle and Cisco in the United States). For example, Chevron in the United States has gradually withdrew from China and the United States in 2015-2018, and began to develop supply chain relations in Vietnam, Colombia, Spain, Kazakhstan, Sri Lanka and other countries.

However, for most multinational companies, the cost of resetting the industrial chain is relatively high, not only because of the tariff, but also because of the logistics cost, infrastructure, supply chain, the completeness and maturity of supporting industries, etc.. For example, affected by labor restrictions and factory rent in Vietnam, production lines of Zara, Uniqlo and other well-known brands have been reduced or suspended after

being transferred to Vietnam. At the same time, China has a relatively complete industrial supporting system and is still at the core of the global supply chain, while Southeast Asian countries are still far behind China in terms of technology level, management mode, industrial sector, and policy environment.

China's core position in global value chain cannot be replaced easily in the short term. In the process of erecting high tariff barriers between China and the United States, some American companies may shift production lines to the destination market because they may not be able to absorb the costs. For example, Apple decided to move its final production line to China due to lack of screws. At the same time, enterprises with long industrial chain such as Apple company have taken precautionary measures before the conflict because they were extremely sensitive to the environment of production chain. According to statistics, the proportion of local suppliers of Apple in the US has dropped from 33.35% in 2014 to 27.09% in 2018.The traditional global value chain is undergoing structural transformation and reshaping, and new global investment and trade rules are taking shape.

1.2 The regional value chains are continuously strengthened

The forces of globalization have promoted the global dispersion of production activities as well as regional agglomeration. In order to pursue agglomeration effect and complementary effect, countries with similar geographical locations have built regional value chains. After the Second World War, with three large-scale industrial transfers around the world, three major production networks in East Asia, Europe, and North America were formed which constituted the three RVCs. Within each regional value chain, there are core countries and regions, and the core countries are more inclined to conduct intermediate goods trade with other countries in the region. Multinational companies rely on the comparative advantages of each regional value chain to carry out production layout in the world, so that the three GVCs form a complete global production network.

For example, Apple's design is in the United States, the production line is mainly in China, India, Vietnam and other countries, while the delivery is global, Apple has realized the global layout of the value chain by taking advantage of the technological competitive advantaged in North America and the manufacturing advantages in Asia. From the perspective of regional division of labor, East Asian regional value chain tends to trade low-tech manufacturing intermediate goods trade, European regional value chain tends to trade intermediate goods of high-tech equipment manufacturing, and North American regional value chain is inclined to trade Intermediate goods of service industry.

Driven by the new round of scientific and technological revolution, the regional value chain is constantly strengthened. From the data of regional intermediate trade, the intra-regional trade of East Asian production network is strengthening during the period of 2000-2017, while the two major and Asian production networks. The inter-regional trade between production networks in Europe and Asia or between production networks in North America and Asia is strengthening. At the same time, from the perspective of the layout of multinational companies, Asia's regional value chain is strengthening. For example, from the regional distribution of Apple's global suppliers, suppliers in Asia in 2012-2017 showed a rising trend, supplier in Europe were relatively stable, while those in North America were significantly reduced (see Table 1).

In the new round of scientific and technological revolution, digital technology promotes the flexibility and automation of production and service modes, combined with the higher requirements for shortening the supply chain and strengthening the control of production

and service, leading to the decrease of the demand for enterprises to establish commercial presence overseas; the return of manufacturing and trade protectionism in developed countries will strengthen the three regional value chains of East Asia, Europe and North America.

Table 1. Value Chain Classification and Evolution of Apple Mobile Phone Component Suppliers in 2012-2017

Area	country / region	High value parts 2012/2017	Medium value parts 2012/2017	Low value parts 2012/2017	Total number of suppliers
Europe (Western Europe)	Austria	0 / 1	2 / 1	0 / 0	13/13 supply is smaller
	Belgium	0 / 0	0 / 0	1 / 1	
	Finland	0 / 0	1 / 1	0 / 0	
	Netherlands	1 / 1	1 / 1	0 / 0	
	Switzerland	1 / 1	0 / 0	1 / 0	
	Germany	2 / 1	0 / 2	2 / 2	
	United Kingdom	0 / 0	1 / 1	0 / 0	
America	United States	20 / 14	12 / 9	9 / 6	41/29 significant drop
Asia (East Asia, Southeast Asia, West Asia)	Japan	16 / 17	19 / 18	5 / 6	117/140: Significant increase, the most obvious increase are mainly in China and Taiwan,
	Korea	5 / 5	3 / 3	0 / 1	
	Singapore	0 / 1	1 / 1	3 / 3	
	Taiwan, China	9 / 8	18 / 19	12 / 18	
	China Hong Kong	2 / 1	4 / 0	2 / 3	
	China Mainland	2 / 5	12 / 24	3 / 6	
	Saudi Arabia	0 / 0	0 / 0	1 / 1	

1.3 Belt and Road Partner countries embrace new opportunities in integrating into global value chains

In the new round of global value chain restructuring, the GVC turning from closed to open, the re-adjustment of the global consumer market and the competition for service links all promote the global layout of transnational corporations to move from east and south. It provides new opportunities for the developing countries, which were originally excluded from the international system of division of labor, to integrate into the world economy. increase their participation in global trade and diversify their exports.

Jointly building the Belt and Road is a new opportunity for developing countries to integrate into GVCs. The dominant position of multinational corporations in Europe and the United States is being broken in the process of global value chain reconstruction. For example, in the digital economy, the higher value-added status is being occupied by enterprises in developing countries; driven by open innovation, it has become the norm for developing countries to carry out industrial gradient shifts and value chain climb.

Countries along the “Belt and Road” have the advantages of integrating into the GVC in the future, such as expanding of the consumer markets increasing competitiveness in the digital economy, deepening penetration of the Internet and technology transfer in the process of Belt and Road construction. The Belt and Road Initiative focuses on the infrastructure construction, continuously optimizing the transportation network composed of railways, highways and ports, as well as the power and communication network. Under the BRI ,it will reduce the cost of cross-border logistics, consolidate the foundation of economic growth, and attract more industry transfer and investment; it will help countries along the belt and road to upgrade their technologies and value chains through industrial capacity cooperation; make countries in Southeast Asia ,South Asia, West Asia, Central and eastern Europe and African countries better integrate into global value chains, by effectively reducing trade and investment barriers between relevant economies.

2. China’s development strategy for participating in the global value chains

Since the 1990s, the effective integration of resources and the pattern of international division of labor have changed dramatically around the world, which has formed a global value chain based on the division of labor within products. In order to gain an active position in the international division of labor and achieve the high-quality economic development, China should strive to enhance its participation in the global value chains by vigorously developing high-tech industries and improving the quality of factor inputs.

2.1 The development stages of China's processing trade (from the 1980s to the present)

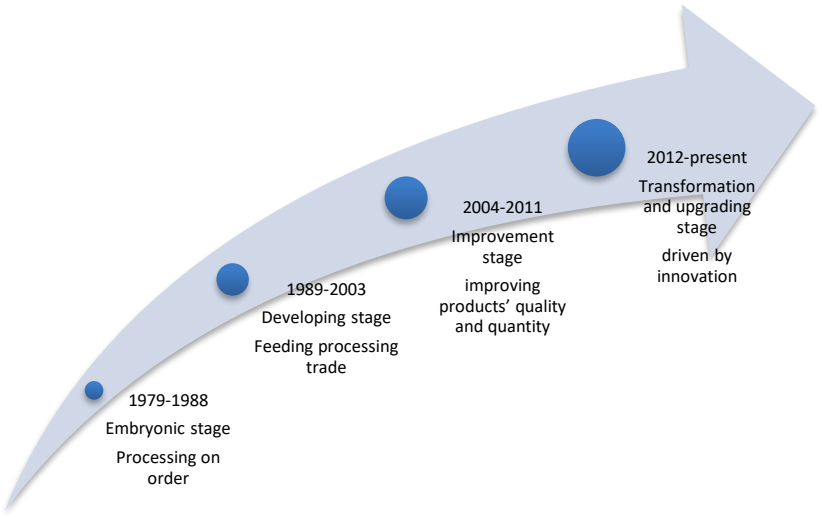
Processing trade refers to the trade mode of importing all or part of intermediate products such as raw materials, accessories and packaging materials from abroad, assembling them into finished products and finally exporting them to foreign countries. It is a low value-added production activity at the low end of “Smile” curve of the global value chains. The nature of processing trade is to complete different production processes in different countries according to the production factors and advantages of each country, thereby realizing the optimal allocation of resources, improving the efficiency of resource use. So processing trade can reduce production costs and enhance the international competitiveness of enterprises and products.

After the reform and opening up, China has attracted a large number of foreign-funded enterprises to enter the Chinese processing trade industry with its cheap labor, preferential tax policies and abundant resources, thus China has participated successfully in the global value chains and become the world's factory. Processing trade has become an important way for China's foreign trade development, it not only promotes the development of China's foreign trade, but also plays an important role in promoting employment, adjusting industrial structure and increasing government revenue.

There are four main methods of processing trade, including processing on order, feeding processing trade, assembling trade and collaborative production. Among them, processing on order and feeding processing trade are more widely used in China, and greatly promotes the development of China's trade in goods. Taking the evolution history and the development goal as reference, processing trade has experienced four stages in China: the 1980s was the embryonic stage based processing on order; from the end of the 1980s to the beginning of the 21st century, the second is the developing stage

based on feeding processing trade; from 2004 to 2011, the third is the improvement stage with the goal of improving products' quality and quantity; from 2012, China's processing trade entered the transformation and upgrading stage driven by innovation, began to get rid of the simple assembly trade, and go toward the high ends of GVC (Figure 1).

Figure 1. China's processing trade development process



2.1.1 The embryonic stage based on processing on order (1979-1988)

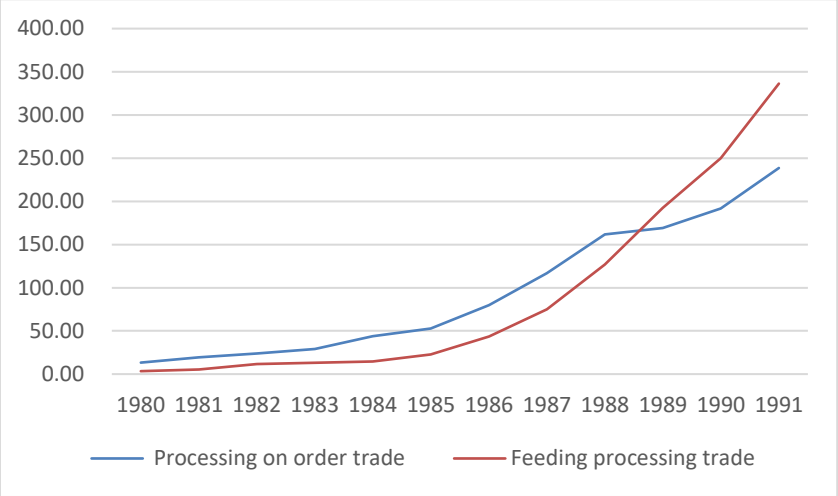
This stage is the germination and exploration phrase of processing trade in China. Since the development level of processing trade was low, China adopted active trade policies that encouraged processing on order to comprehensively reduce restrictions on processing trade enterprises, and to encourage enterprises to carry out the assembling on provided parts, the processing with foreign designs and the compensation trade.

In August 1978, China promulgated *the Trial Measures for the Development of External Processing and Assembly Trade* and began to try out processing trade in Shanghai, Guangdong and Fujian. In September 1979, China promulgated *Measures on Foreign Processing and Assembly Trade and Small and Medium Trade Compensation*, which marked the establishment of China's processing trade as a new foreign trade model. Since then, processing trade has sprouted in China and developed rapidly. In 1987, China promulgated *the Request for Seizing the Advantages of Further Developing the Business of Processing and Assembly on order and Other Services*, and clearly proposed to encourage small and medium-sized enterprises and township enterprises to actively carry out processing on order, while giving priority to the development of special economic zones, open coastal cities and open areas.

At the same time, China has continuously given more preferential policies to processing and assembly enterprises in terms of business tax, income tax and foreign exchange, and provided financial support for the infrastructure construction and technological transformation of these enterprises. Domestic-funded enterprises located in the southeastern coastal areas of China seized the opportunity to actively develop the processing on order trade by using superior geographical location and low-cost and abundant labor resources, which has promoted the development of China's processing trade.

At this stage, the import and export volume of China's processing trade grew steadily. In 1988, the total import and export volume of processing trade was 17 times that of 1980. The proportion of import and export of processing trade accounted for a significant increase in the proportion of foreign trade imports and exports, from 4.4% in 1980 to 28% in 1988. The processing and assembly on order trade has been accelerated under favorable economic environment and policy support, and has become the main mode of processing trade in China (Figure 2). The import and export volume of processing on order trade accounted for more than 50% of China's total import and export volume of processing trade (Figure 3).

Figure 2. China's import and export volume of processing trade 1980-1991(billion USD)



Source: General Administration of Customs of China, Ministry of Commerce of China

2.1.2 Developing stage based on feeding processing (1989-2003)

Between 1989 and 2003, as China continued to reform its foreign trade system and undertake international industrial transfer, the status of processing trade in foreign trade rose rapidly in China, and feeding processing gradually developed into the main mode of processing trade. Since 1989, Japan, South Korea, Singapore and other western developed countries, having found Chinese huge labor market and domestic market consumption capacity, transferred a large number of labor-intensive enterprises to China, and increased their investment in the Chinese market.

At the same time, China promulgated successively many policies and regulations, *Measures on the Administration of Import and Export Goods for Feeding Processing, Notice on Strengthening the Management of Re-export Trade of Feed Processing, Foreign Trade Law, Interim Measures of Customs on Supervision of Export Processing Zones* and so on, in order to attract foreign-invested enterprises to settle in China, promote the development of feeding processing trade and push forward the reform of foreign trade and investment. These policies and regulations not only realized the rapid development of processing trade, but also accelerated the standardization of processing trade.

At this stage, China's processing trade entered the rapid development stage, and accounted for a huge increase in the proportion of imports and exports trade, breaking through 50% in 1996-1999 (Figure 4), so it made an important contribution to China's foreign trade development. Foreign-invested enterprises are the main participants in the

feeding processing trade whose proportion in the total import and export volume of processing trade was increasing year by year, and feeding processing trade began to exceed the processing on order trade，in particular during the period 1991-1999 when the ratio of feeding processing to processing trade quickly rose from 58.5 % to 77.5% (Figure 3). That’s to say, feed processing dominated the processing trade in this stage.

2.1.3 Improvement stage with the goal of improving products’ quality and quantity (2004-2011)

Faced to the economic globalization, China has further expanded its opening up and raised its openness level from the beginning of the 21st century. Joining the World Trade Organization in 2001 marked a new stage for China's opening up to the outside world. Since then, China has gradually lowered tariffs, opened up the domestic market, and achieved rapid development in foreign trade. The total volume of imports and exports of goods has risen rapidly, and the import and export volume of processing trade has also increased significantly (Figure 4). The contribution rate of processing trade to China's foreign trade is basically maintained between 40% and 50%.

During this period, problems caused by China's processing trade have also emerged. The most obvious was that the development model of “high pollution, high energy consumption and high resource input” posed challenges to China's environmental protection and sustainable development. As a result, China has continuously improved its trade quality while expanding its processing trade. Since 2004, some high energy consumption, high pollution and intensive-resource products have been listed in the prohibited commodities list for processing trade, and were constantly updated to optimize processing trade structure.

2.1.4 Transformation and upgrading stage driven by innovation (2012-present)

Affected by the sluggish external demand and various domestic and foreign unfavorable factors, although the total volume of processing trade in China has increased, the ratio of processing trade to total foreign trade has shown a clear downward trend. So the contribution rate of processing trade to China's foreign trade development declined. In addition, with the economic development and social progress, the labor cost advantage of China is gradually disappearing.

And most Chinese processing trade enterprises, short of core technologies, independent innovation capabilities and international competitiveness, are always responsible for the simple processing and assembly processes at the low end of the GVC, so their profit margins are always narrow, and the quality and efficiency of processing trade are lower than other countries. In addition, the regional development of China's processing trade is unbalanced, and the management mechanisms and policies are not compatible with the requirements of transformation and upgrading, the contradiction is becoming more acute between green development and resource-intensive high-polluted processing trade.

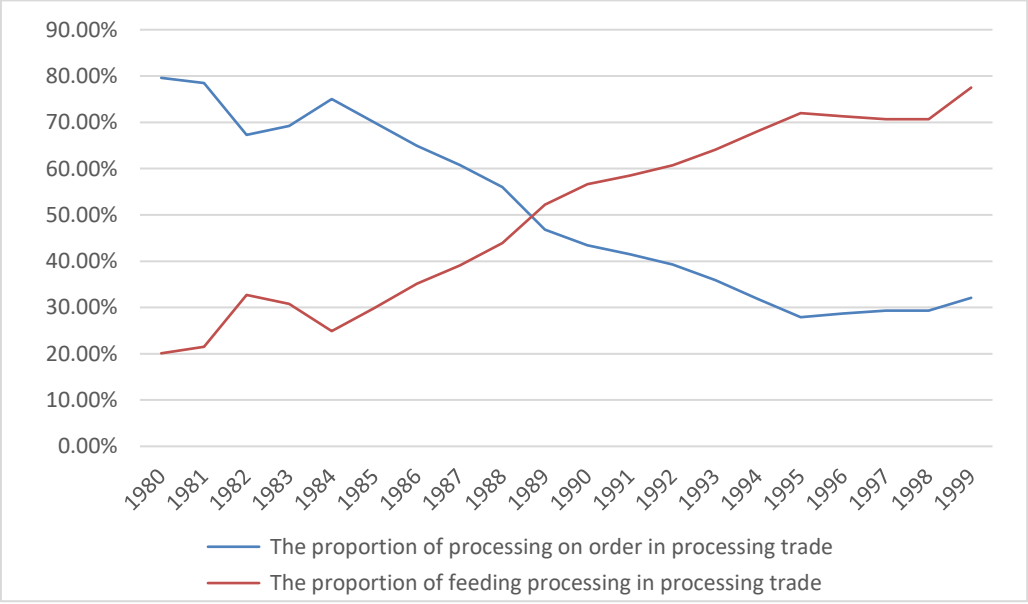
In order to cope with the new challenges brought by the changes in global value chains and international division of labor, in order to comply with the new requirements of the development of China's socialist market economy and better promote the orderly development of China's economy, China actively promotes the transformation and upgrading of processing trade with innovation.

In November 2011, China issued *the Guiding Opinions on Promoting the Transformation and Upgrading of Processing Trade*, proposing to optimize the product structure,

promote the processing trade development toward the high-end of the industrial chain, extend the domestic value-added chain, and accelerate the orderly gradient transfer of processing trade. In 2016, China issued *the Several Opinions on Promoting the Innovative Development of Processing Trade,* clearly proposing to use innovation and larger openness as the driving force to develop processing trade. The goal is to achieve positive results in processing trade innovative development by 2020, and further walk toward to the high end of the GVC. In November 2018, China issued *the Announcement on Expanding the Pilot of VAT General Taxpayer Qualification of Enterprises in Special Customs Supervision Areas*, further improving of the quality and efficiency of special customs supervision areas, and promoting the transformation and upgrading of processing trade and trade facilitation.

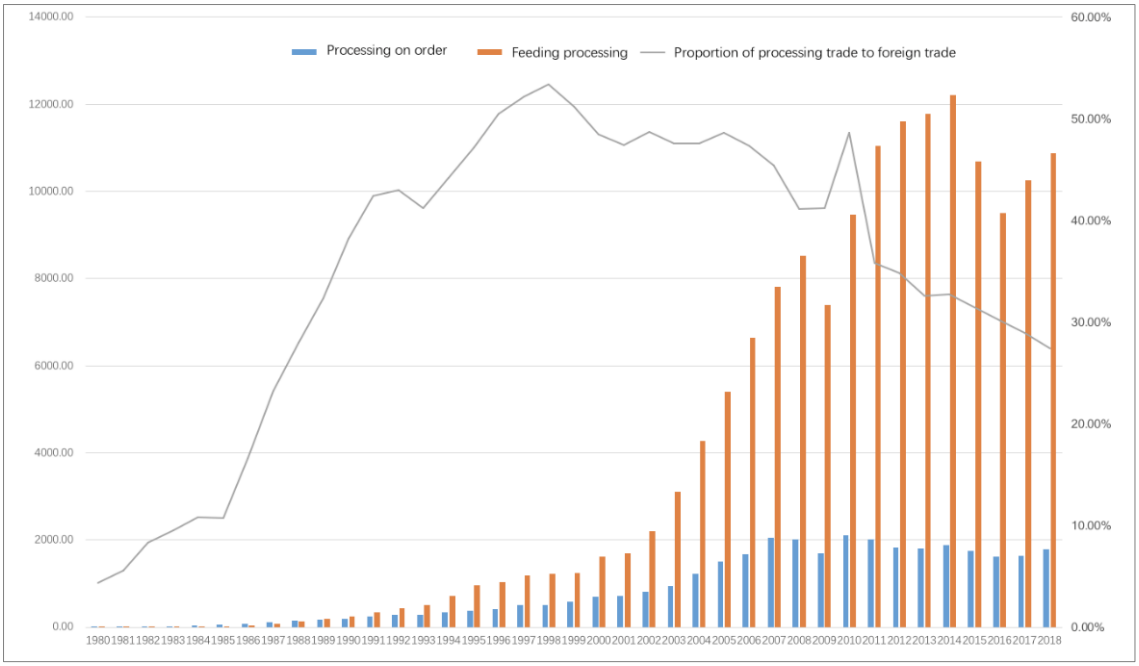
After years of development, the transformation and upgrading of processing trade has achieved initial results in China. Chinese processing trade industry has continuously increased the introduction of high-tech enterprises, such as computer enterprises, mechanical and electrical enterprises, pharmaceutical enterprises and other high-tech enterprises, in the process of undertaking industrial transfer, while reducing the production of high-pollution, high-consumption and resource-intensive products, continuously optimizing production structure, increasing added value and resource utilization rate of products. At the same time, inland and border areas have gradually undertaken industrial transfer to balance the regional development.

Figure 3. Processing trade pattern development in China



Source: General Administration of Customs of China, Ministry of Commerce of China

Figure 4. Development of Processing Trade in China (billion USD)



Source: General Administration of Customs of China, Ministry of Commerce of China

2.2 Opening-up strategy to promote value chain upgrading at a higher income level

In the new stage of comprehensively deepening reform and opening up, China has adopted the “13th Five-Year Plan” and “Made in China 2025” as the programmatic documents to gradually expand foreign trade, to optimize the efficiency and structure of foreign capital utilization, to improve quality and efficiency of manufacturing industries by accelerating the innovative development, to actively promote the transformation and upgrading of processing trade, to upgrade China's industrial level, and then promote China's higher-level opening-up in the new economic development stage.

2.2.1 Strategies and measures on promoting foreign trade

Vigorously promoting the construction of special customs supervision areas and Pilot Free Trade Zones.

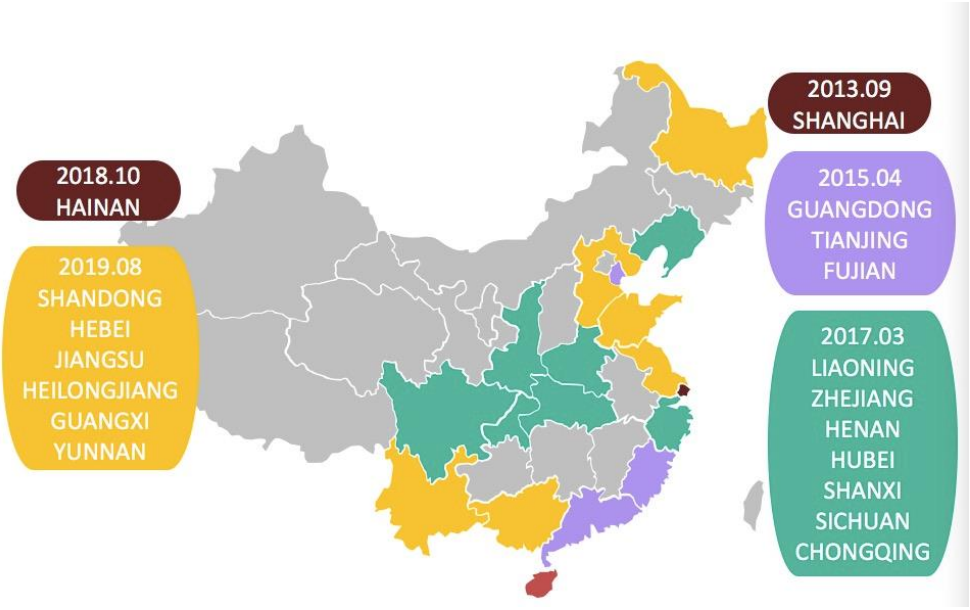
Since the State Council approved the establishment of the first bonded zone in 1990, China has actively developed export processing zones, bonded logistics parks, bonded port areas, comprehensive bonded areas and cross-border industrial zones. As of January 2019, China had 140 special customs supervision areas, including 96 comprehensive bonded areas. At present, the import and export value of the special customs supervision areas accounts for 16.8% of China's foreign trade, compared with 6.47% in 2000.

From September 2013 to August 2019, China has established 18 pilot Free Trade Zones (Figure 2-5), from coastal areas to inland or border areas, and has initially formed the linked land-sea opening pattern. China can explore higher-level opening-up measures and administration systems through Pilot Free Trade Zones. For now, China has established a processing trade procurement, distribution and settlement center to encourage multinational companies to carry out offshore settlement business and promote the transformation and upgrading of processing trade. Pilot Free Trade Zones

have fully utilized the agglomeration of modern service industries and cultivated a number of innovative and developed service trade leading enterprises, as well as many service brands with strong international competitiveness.

China has comprehensively implement reform measures in Pilot Free Trade Zones to promote trade facilitation, such as “Single Window”, one-stop operation, integrated customs clearance, Government Information Sharing (GIS) platform, and risk prevention and control system.

Figure 5. Time and region of establishment of Pilot Free Trade Zones

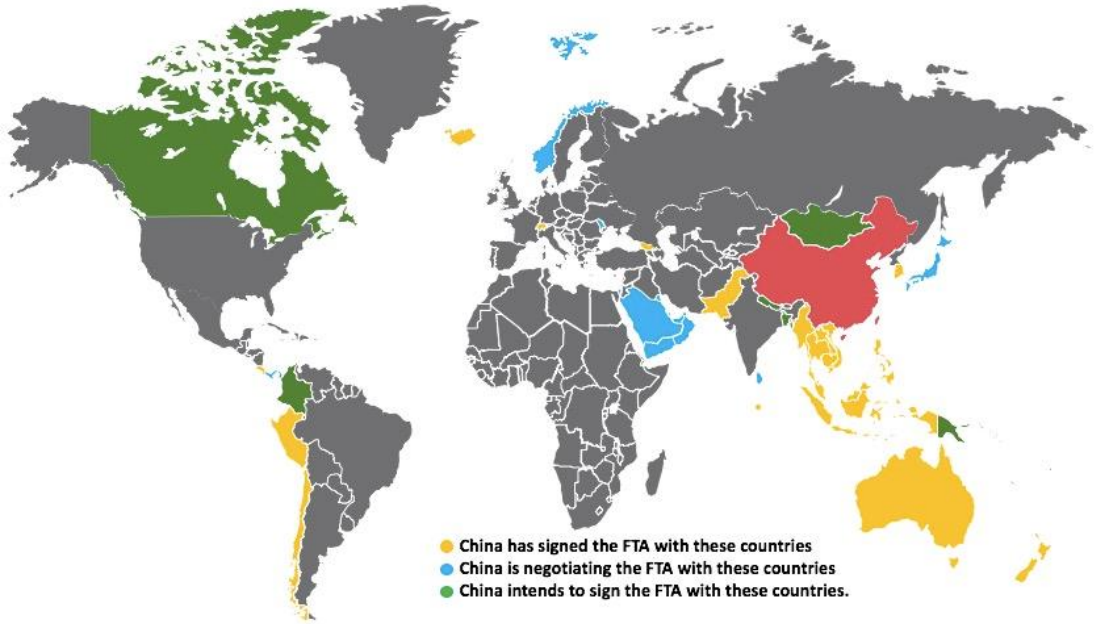


Accelerating the construction of free trade zones and negotiations on free trade agreements.

Accelerating the construction of free trade zones with other countries is an important part of China's opening-up strategy. China has sighed 17 free trade agreements with 25 countries and regions including ASEAN, Chile, Pakistan, New Zealand and Singapore (Figure 6). The free trade partners are located in Europe, Asia, Oceania, South America and Africa.

Through FTA, China and its free trade partners have lowered tariffs, eliminated trade barriers, and have realized the higher-level openness than WTO, providing opportunities for Chinese products to enter the global market, enhance international competitiveness, and build international brands.

Figure 6. China's Free Trade Agreement with Other Countries



Innovating trade methods

While vigorously developing general trade and processing trade, China has actively explored new trade methods and established new systems to facilitate trade facilitation, for example the cross-border e-commerce. At the end of 2018, China promulgated *Notice on Improving the Supervision of Cross-border E-Commerce Retail Import Trade* to complete the cross-border e-commerce supervision system.

In January 2019, *the E-commerce Law* was officially implemented, with emphasis on promoting cross-border e-commerce development. With this new law, China establishes and improves management systems for customs, taxation, inbound and outbound inspection and quarantine, payment and settlement, in order to increase cross-border e-commerce facilitation, and support small and micro enterprises to engage in cross-border e-commerce.

2.2.2 Strategies and measures on attracting foreign direct investment

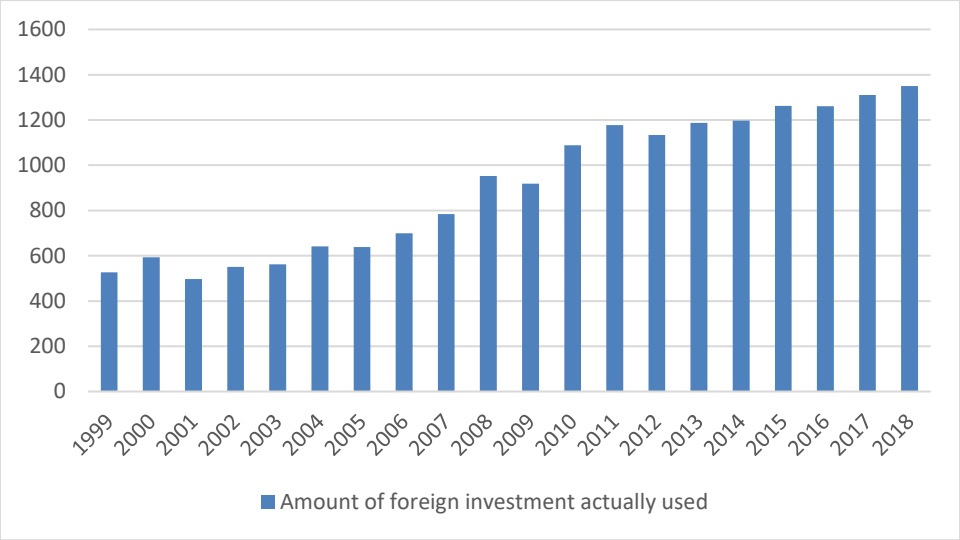
Optimizing the investment environment to increase foreign investment

The use of foreign investment is an important part of China's opening-up policy aiming to establish a new open economic system. China continues to implement the high-level investment liberalization and facilitation policy, and tries to create a fairer, more transparent, convenient and attractive investment environment by learning from international advanced experiences. With these policies, China maintains its position as a major destination for foreign investment in the world, further promotes the steady growth of foreign investment, and achieves high-quality economic development driven by a high level of openness.

In 2018, the State Council issued the Notice on Several Measures for Actively and Effectively Utilizing Foreign Investment to Promote High-Quality Economic Development for deepening the reform in the field of foreign investment management, creating a higher standard investment environment, and guaranteeing liberalization, facilitation, promotion and protection of foreign investment. At the same time, China optimizes the regional

opening-up layout, strengthens infrastructure construction in the central and western regions as well as border areas, and guides foreign investment into the above-mentioned areas to stimulate local development.

Figure 7. Amount of foreign investment actually used in China (100 million USD)



Source: National Bureau of Statistics of China

Expanding the open field and reducing access restrictions

In March 2019, China passed *the Foreign Investment Law*, replacing the existing relevant laws and regulations. The new law, complying with the new requirements of reform and opening up, will implement the “pre-entry national treatment + negative list” system to simplify foreign investment procedures and expand the field of foreign investment. The law also will lower the barrier to entry of foreign investment, effectively promote, protect and manage foreign investment in China. The law will effectively encourage overseas funds and advanced technologies to entre China, which can improve the quality of foreign capital utilization.

Taking the automobile industry as an example, the newly released *Negative List of Foreign Investment* clearly cancelled the 50:50 ratio limit for foreign investors in building new energy automobile factories in China. In this case, Tesla established a wholly-owned automobile assembly plant in Shanghai. In the future, more foreign capital will enter the field of new energy vehicles in China, which will promote the green innovation of China's auto industry.

Guiding foreign investment to high-tech industries

China regularly publishes *the Guideline Catalogue of Industries for Foreign Investment.* On the basis of maintaining the continuity and stability of foreign investment policies, the 2019 edition further expands the scope of industries for foreign investment. The guideline catalogue added 5G core component components and other items to the electronic information industry catalogue, added items such as key raw materials for cell therapy drugs in the modern pharmaceutical industry catalogue, added items such as industrial robots and key parts of smart cars to the equipment manufacturing catalogue. The new edition will further encourage foreign investment enter modern agriculture, advanced

manufacturing, high-tech industry, energy-saving and environmental protection field, and modern service industry.

The Guideline Catalogue can effectively promote the regional and industrial distribution of FDI, and give full play to the positive role of foreign capital in China's industrial development, technological progress, and structural optimization.

2.2.3 Strategies and measures on industrial upgrading and innovation

Implementing "Made in China 2025" to promote high-level, intelligent and green development of industries

China adheres to the organic combination of technological innovation and business model innovation, vigorously develops new industries, new technologies and new formats with good prospects and high benefits, fosters a number of key industrial zones, key enterprises and key projects, builds high-level emerging industrial clusters, in order to give full play to the supporting role of high-tech industries and strategic emerging industries.

China uses modern information technology such as big data, cloud computing, Internet of Things, artificial intelligence, to promote the upgrading of production, management and marketing models, realize the intelligentization of the entire industry chain from user demand to product supply, and promote the deep integration of new technologies with the R&D, production, management, services of manufacture industry, and foster an ecosystem of "Internet + service industry".

China integrates the concept of green development into the whole process and all aspects of industrial transformation and upgrading, accelerates the development of green and low-carbon circular economy, actively promotes green technology innovation such as green engineering and green design, and vigorously promotes greening of agriculture, low carbonization of industries, and environmental protection of service industries.

Increasing R&D investment to promote the transformation of scientific and technological achievements

Science and technology are the primary productive forces, and innovation is a powerful driving force for leading development and realizing industrial upgrading and transformation. China continues to increase investment in scientific research, and encourages various entities to participate in scientific and technological innovation through incentive policies and measures such as tax incentives and tax credits, especially to guide enterprises to increase investment in technology research and development.

Through the combination of production, learning, research and application, China has made scientific research oriented to economic production whose development depends on scientific research, and China has formed a long-term innovative cooperation system between universities, research institutes and enterprises to stimulate the transfer of scientific and technological achievements.

In addition, China also implements incubator support policies and encourages the establishment of comprehensive incubation system by forming a development model of "makerspace -incubator-accelerator-science park", in order to enhance the comprehensive service capabilities of technology business incubators, and to provide a better environment for innovation.

Implementing the "Talent Priority" development strategy to create a better environment for the development of innovative talents

China adheres to the concept of Talent Priority, vigorously implements the strategy of "strengthening China with talents", pays equal attention to talent cultivation and talent introduction, so as to continuously improve the quantity and quality of talents.

In 2016, China issued *Opinions on Deepening the Reform of Talent Development System* to enhance the vitality of talents and form an internationally competitive talent system from six aspects: promoting the reform of the talent management system, improving the talent training mechanism, innovating talent evaluation mechanism, improving the talent migration mechanism, building an internationally competitive talent utilization mechanism, and establishing a priority mechanism for talent development.

At the national level, the "Overseas High-level Talents Introduction Program" (the "Thousand Talents Plan") was implemented, while the "Hundred Talents Plan" was implemented at all of Chinese provinces. According to the needs of social development and industrial restructuring, a number of overseas high-levels were introduced in a targeted manner. Talent.

Since 2018, China has set off a "war for talents" and established a more flexible and open mechanism for overseas talents and domestic talents. It retains talents with attractive policies and promotes the concentration of key talents, thus enhancing regional vitality and innovation capacity.

3. China's experience in participating in global value chains

By continuously adjusting foreign trade measures, two-way investment policies, adjusting domestic innovation strategies, and building a national innovation system to promote industrial upgrading, China has promoted the transformation from embedding the GVC to actively constructing a RVC based on China. Over the past 40 years of reform and opening up, China has accumulated valuable experience in participating in the global value chain, which can provide some reference for the development of partner countries along *the Belt and Road*.

3.1 Promoting integration into GVCs with a gradual open strategy based on China's actual development

From the process of opening up and integrating into the GVC, China has always determined the policy of opening-up in accordance with the reality and followed the logic of gradual opening-up. China has adopted the reform policies in full accordance with its development stage, and has always adhered to the open model of experimentation before promotion.

China has always made strategic decisions on opening-up based on China's actual development. Since the establishment of the opening-up policy in 1978, China's opening up policy has gone through *Market-for-capital, Accumulating Trade Surplus* (1979-1992) - *Radical Export-Oriented Strategy*(1993-2001) *-Liberalized Export-*

Oriented [1] *Strategy* (2002-2012) - equal import and export, the two-way investment strategy (2013-present).The determination of the opening-up policy in 1978 was based on the actual development of China at the beginning of reform and opening up such as the low level of social productivity, the marginal position in the global trading system, and poor self-sustaining ability of enterprises.

After 1992, China's overall development level and the company's self-generating capacity were improved, while export encouragement policy could lead to faster industrial structure upgrading and output increase. At this stage, the foreign trade strategy evolved into a radical export-oriented strategy. The comprehensive opening strategy of paying equal attention to import and export and two-way investment started to be implemented all around China in 2012, is based on the decrease in global demand after the financial crisis, which makes the export more difficult, the insufficient domestic supply to meet the demand for upgrading consumption At the same time, the new round of scientific and technological revolution is promoting a new round of industrial transfer.

China always adhere to the logic of first trial in one or two pilot provinces, then promotion to implement in wider area. The regional imbalance of China's economic and social development determines that the pace of reform and opening up is difficult to unify the program and keep pace in all the provinces. China's opening up to the outside world typically exemplifies the characteristics of piloting, from point to point, and comprehensive promotion. From the 1980s to the end of the 20th century, four special economic zones including Shenzhen were gradually expanded to 14 coastal cities, and then the expanded to the region along the River and the border. Since the 21st century, China has vigorously promoted the development of industrial parks and bonded zone strategy. In the new stage, FTZs have been established from Shanghai to Tianjin, Guangdong and Fujian, and then Hainan island, and Shandong and Hebei provinces, etc..

The strategy of gradual opening is also reflected in the means, areas and ways of opening up. In the 40 years of reform and opening up, China has gone from relying on preferential policies such as taxation, land and finance, to attracting foreign investment with a fair, competitive and open business environment; from gradually reducing tariffs after joining the WTO to facilitating investment and trade facilitation, speeding up the reform of streamline administration and delegate powers, and actively expanding the opening fields of service trade. The gradual opening strategy promotes China's development from embedding in the GVC to participating in the GVC and then to constructing China's RVC.

3.2 Adhere to the combination of Bringing In and Going Global

Bringing In (mainly FDI) and *Going Global* are important aspects of China's economic growth and integration into the global value chain in the past 40 years of reform and opening up to the outside world. FDI provides a platform and opportunity for improving China’s industrial system and improving manufacturing enterprises’ production technology and management level. It can be regarded as a passive way to participant in the global value chain. Going global enables Chinese companies to participate directly in the operation of global value chains by actively seeking natural resources, market opportunities and strategic resources.

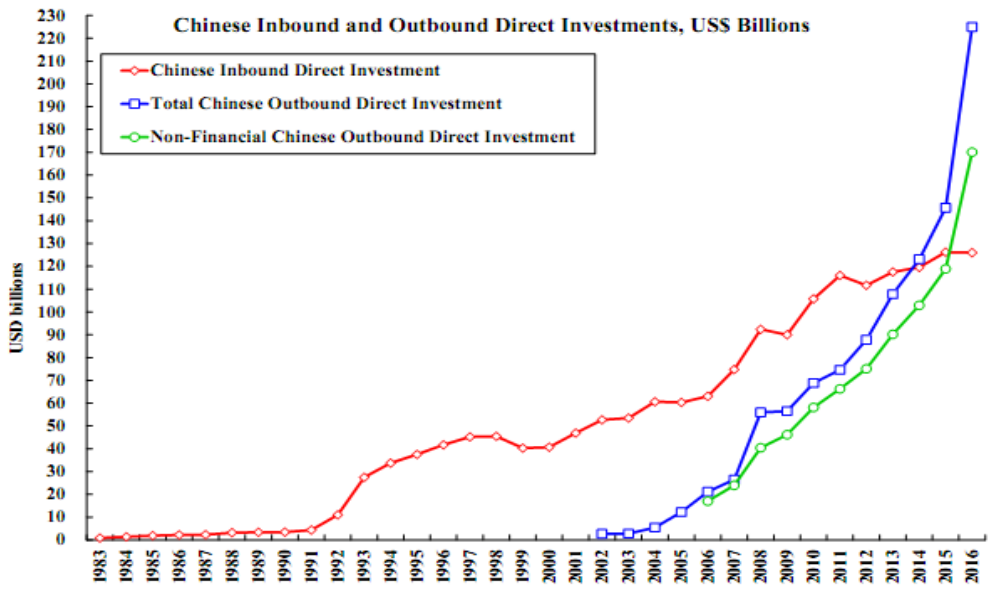
[1] Import restrictions, appropriate export incentives; import restrictions are greatly reduced, export incentives are increased; import restrictions are low, export incentives are low; imports are encouraged, and exports are encouraged to maintain low levels.

FDI promotes the transformation of domestic industries and adjusts the integration into the global value chain by gradually adjusting the areas of foreign investment and gradually relaxing the policy of foreign investment. By adjusting the *Catalogue of Industries to Encourage Investment*, it has realized the transformation of attracting foreign investment from *Light Textile Manufacturing Industry* to *Industrial Manufacturing Industry* and then to *High-tech Industry*. The quality of foreign investment has been continuously improved, and the technology spillover effect of transnational corporations has been significantly enhanced and the industrial structure has been upgraded.

While improving the quality of FDI，China has accelerated the pace of OFDI which promote China’s deep integration into the global industrial division system. With the continuous improvement of China's industrial system and the enhancement of corporate competitiveness, China has begun to implement the *Going Global Strategy* (2003). China has mainly promoted the construction of overseas economic and trade cooperation zones, cross-border economic cooperation zones, border economic cooperation zones and other platforms.

In the new era, *the Belt and Road Initiative* was proposed to promote the construction of the *Five-Pronged Approach* to create a good hardware and software environment for Chinese enterprises to *Going Global* to the developing countries, which is strengthening China's participation in the construction of regional value chain continuously. Through the common development of FDI and OFDI, China promotes the common development of *Passive Participation in global value chain* and *Direct Active Participation in global value chain*.

Figure 8. China's FDI and OFDI trends since the reform and opening up in 1978



Source: Statistical bulletins on China's outbound direct investment over the years

3.3 Taking full advantage of the demographic dividend to embed into the global value chain

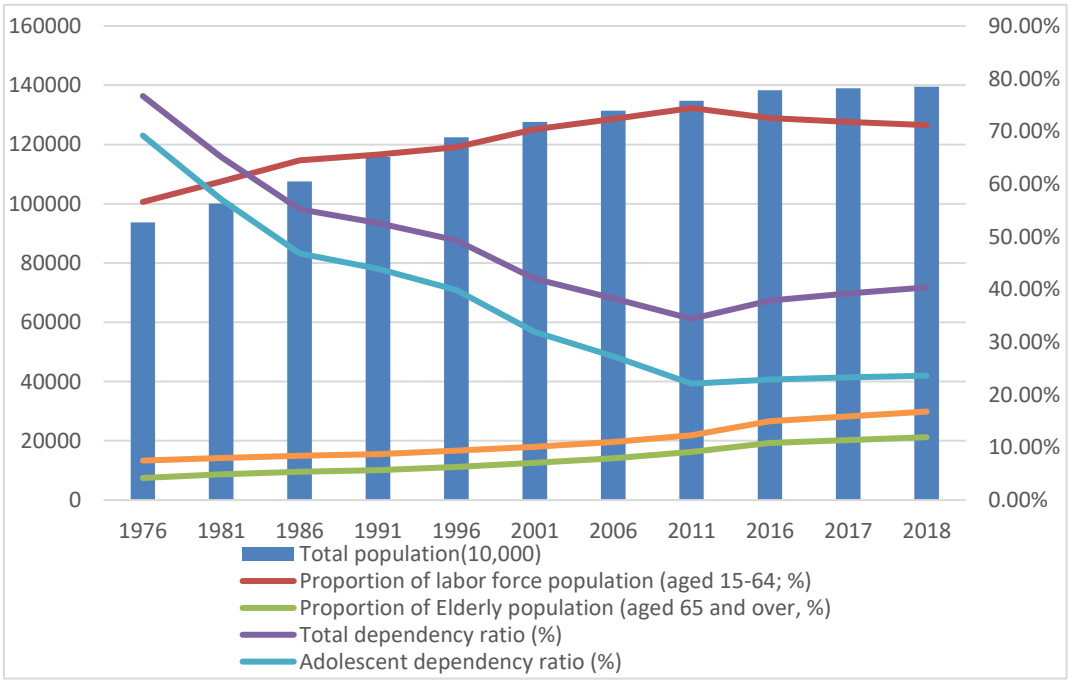
In the 40 years of opening-up, China has seized the traditional period of *demographic dividend* and actively participated in the international division of labor system through

market-oriented reform and opening-up measures. Relying on the abundant labor resources and the advantage of low labor cost formed by agricultural surplus labor force, China has formed a comparative advantage in the production, processing and assembly of products, and successfully undertaken the global manufacturing transfer in the process of economic globalization. By vigorously absorbing foreign direct investment and expanding exports, China has gradually embedded in the global value chain dominated by developed countries such as Europe, the United States and Japan.

Since the 1970s, as China's population accumulation model entered the stage of *low fertility rate, low mortality rate, and low growth rate*, the population dependency ratio declined rapidly and the number of labor force increased rapidly. The comparative advantage of the low labor cost of the Chinese economy gradually became prominent (See Figure 9). At the same time, the land, capital and other production factors invested in China's economic development gradually become abundant. During the same period, China gradually released the enthusiasm for agricultural production through the household contract responsibility system and promoted the transfer of surplus rural labor to the non-agricultural sector.

China has also promoted the transfer of human capital and labor from the low-efficiency state-owned sector to the high-productive private sector through the reform of state-owned enterprises. and stimulated the vitality of market entities through export-oriented development strategy. Especially after joining the WTO in 2001, driven by market-oriented reforms and opening-up strategy, the *Demographic Dividend* has been greatly released. After 2011, although the demographic dividend has been gradually reduced, the business environment of China has been further improved, the vitality of market entities has been further enhanced, and the efficiency of labor resources has been further enhanced, under the promotion of supply-side structural reform, high-quality development and other strategies. China's position in the global value chain has been constantly improved.

Figure 9. Evolution of China's demographic dividend from 1976 to 2018



Source: Database of the statistics bureau of the People's Republic of China

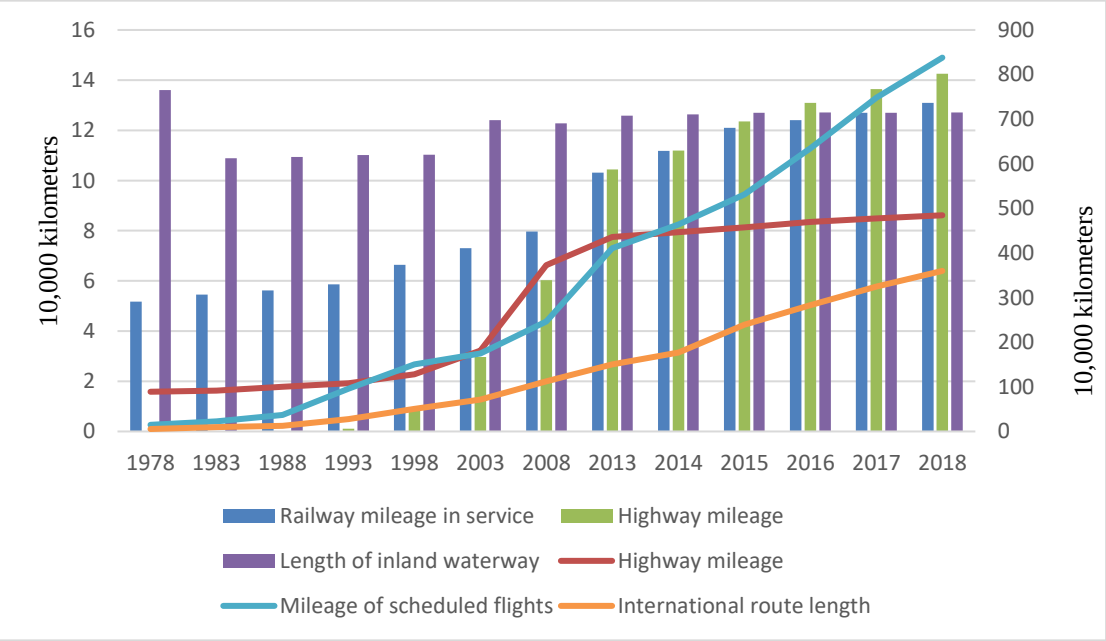
3.4 Always attach importance to infrastructure construction

In the past 40 years, China has successfully integrated into the global value chain, and maintained rapid economic growth is inseparable from the large-scale construction of infrastructure such as transportation, energy, power, and power grid.

As a basic industry for economic development, infrastructure investment can optimize the local business environment, promote inter-regional coordinated development, and alleviate the mismatch of factors, and thus achieve the purpose of promoting long-term economic growth. The level of transportation infrastructure determines the direction of labor migration, can reduce the transportation cost of enterprises, optimize the operating environment, improve the free flow of elements between regions, and attract enterprises to invest and set up factories. The construction of information infrastructure can reduce the consumption of physical capital and human capital, promote industrial integration, innovate industrial formats, improve labor productivity, promote the integration of industrialization and informatization, and promote the manufacturing industry to move up the value chain.

Since the reform and opening up, China has carried out large-scale transportation infrastructure construction, and gradually built a network of railways, highways, aviation, and maritime infrastructure that reaches the whole country and connects with the whole world. This has greatly improved the interconnection and communication of people and promoted the flow of goods. The construction of transportation infrastructure has become an important aspect supporting the development of foreign trade in the past 40 years.

Figure 10. China's transportation infrastructure development in the 40 years



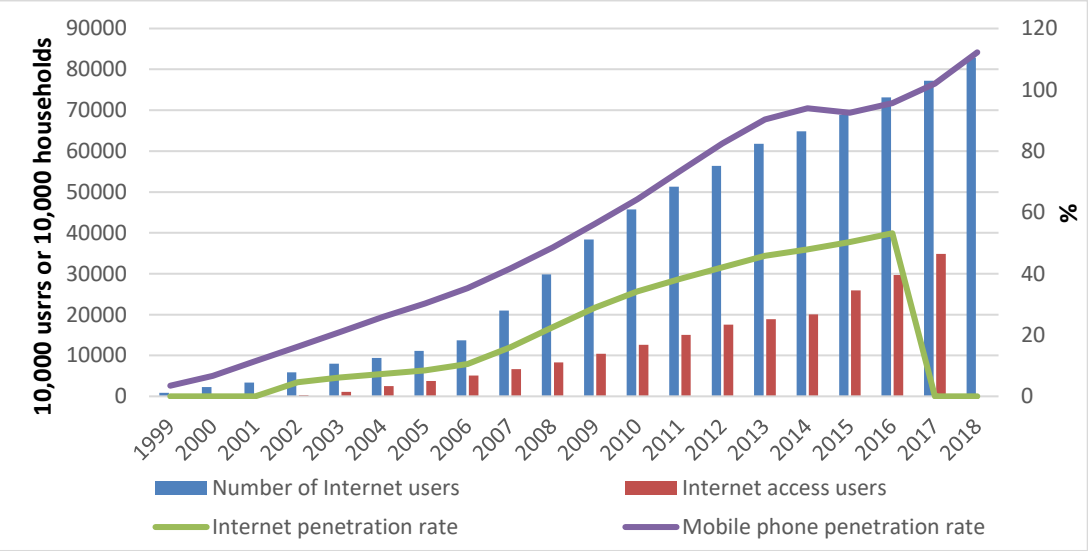
Source: Database of the statistics bureau of the People's Republic of China

After 40 years of construction, China has also made remarkable achievements in power supply and power grid construction. By the end of 2017, the total installed power generation capacity nationwide was 1,77,703,000 kilowatts, which is more than 30 times that of 1978. The total length of power transmission lines of 220 kilo-volts or above reached 688,000 kilometers, 30 times that of 1978. The contradiction of power supply

has been effectively alleviated. At the same time, the scale of China's power grid has ranked first in the world since 2005. During the *12th Five-Year Plan* period, China further solved the problem of electricity consumption for the nation's non-electricity population. The power grid construction has strongly supported the rapid development of the social and economy.

Since the 1980s, especially since the beginning of the 21st century, China's has made great progress in information and communication infrastructure construction. At the end of March 2019, the total length of the national optical cable line had reached 44.71 million kilometers, and in 2005 it was only 4.07 million kilometers. The total number of mobile communication base stations reached 6.62 million, and the number of Internet access terminals reached 889million. The rapid development of China's communication network infrastructure has promoted the rapid rise of telephone penetration, internet penetration and the rapid expansion of the internet users(see figure3-4).It has been an important basis for promoting the development of the Internet economy, big data, Internet of Things, and artificial intelligence in the new era, and has become an important foundation for the realization of the value chain upgrading under the new round of scientific and technological revolution opportunities.

Figure 11. Telecommunications and Internet infrastructure development since the reform and opening up



Source: Database of the statistics bureau of the People's Republic of China

3.5 Accelerating the process of industrialization and moving up the value chain

As a large developing country, China’s rapid integration into the global value chain and its continuous advance to the higher end of the value chain cannot be achieved without the rapid advancement of its industrialization process. It took China several decades to complete the industrialization process of the developed countries for hundreds of years. Since the opening up, under the joint action of the government and the market, China’s industrial development has grown from small to large, from weak to strong, forming a complete industrial system and realizing the march from a large agricultural country to an industrial power.

In 1978, China was still a large agricultural country with the output value of the three industries accounting for 27.7%, 47.7% and 24.6% respectively. Among them, the output value of agriculture accounted for a high proportion, the employed population in agriculture was up to 70.5%, and the total import and export volume was only 9.7% of GDP. At the same time, the industrial system is still in the primary stage of industrialization. After 40 years, China's secondary industry's average value-added growth rate reached 10.9%. In 2018, the GDP of the secondary industry reached 36.6 trillion RMB, 209 times that of 1978. China has developed into one of the few countries in the world with a complete industrial system, with 39 industrial categories, 191 medium categories, 525 sub-categories. Meanwhile, China's technological innovation capability is constantly enhancing. At present, China provides more than 80% of the world's medium and low-end manufacturing products. China's industrialization process has developed rapidly to the later stage of industrialization.

Table 2. Comparison of economic structure between 1978 and 2018

Index	1978	1978	2018	2018	Index
	Number of employed people (10,000 people)	Gross domestic product, 100 million yuan(percentage)	Number of employed people (10,000 people)	Gross domestic product, 100 million yuan (% of weight)	Employment(2018/1978)
National	40152	3678.7	77586	900309	1.93
Primary industry	28318	1018.5 （27.7%）	20257.7	64734 （7.2%）	0.72
Secondary industry	6945	1755.2 （47.7%）	21390.5	366000.9 （40.7%）	3.08
Tertiary Industry	4980	905.1 （24.6%）	35937.8	469574.6 （52.2%）	7.22
Per capita GDP		385.0 (yuan)	64644 (yuan)		

Source: Database of the statistics bureau of the People's Republic of China

The important lesson from China's ability to quickly complete industrialization and move up the value chain is:

First, in the process of industrialization, China relies on the power of market and government to continuously promote the transformation of industrial structure. The government directly intervened in the formation of industrial structure and promoted the rapid formation of industrial systems by means of strong selective industrial policies. The main policy is to provide more government support to the infant industries in need of development in a key position with preferential policies such as tax, land and capital, It could help overcome the constraints of factors, cultivate the industrial base and make it grow stronger.

For example, in the early stage of reform and opening up, the *Six Priority Policies* were implemented to support the textile industry, which mainly giving policies on resources, capital, foreign exchange, technology, infrastructure and transportation, etc., which promoted the development of labor-intensive industries. After entering the 21st century, China mainly guides industrial development by formulating *Industry guidance catalogue*, such as *Catalogue of Industries*, *Products and Technologies Currently Encouraged by the State* (2000), *Catalogue of Eliminating Outdated Production Capacity, Processes and Products* (2002), *The Industrial Structure Adjustment Guidance Catalogue* (2005,

2009, 2011), etc., The guidance catalogue promoted the effective allocation of resources to the government-led industries.

Second, China can grasp the direction of industrial upgrading based on the stage of industrialization development, continuously adjust industrial policies and implementation methods, and achieve effective coordination between industrial policies and competition policies. With the continuous improvement of the industrial development system, the government gradually eliminates the policy of strong intervention, and shifts to policies that promote competition and encourage innovation, such as technological innovation, promoting the transformation of scientific and technological achievements, promoting the marketization of production factors, protecting patents and intellectual property rights, etc. The implementation of the policies effectively promoted technological progress, improved industrial efficiency and promoted the upgrading of industrial structure.

Third, in the process of industrialization, the industrial parks have driven the process of national industrialization. In the past 40 years, various economic development models with distinct regional and era characteristics have emerged in different regions, such as the *Pearl River Delta Model*, *Southern Jiangsu Model*, *Wenzhou Model*, etc. These models are different in terms of initiating conditions, initiators and capital formation, but they all had promoted the local industrialization process, making these areas become industrialized areas with higher development levels, and thus played a huge role in promoting the industrialization process of the whole country.

3.6 Attaching importance to the construction of the national innovation system and enhancing independent innovation capacity

Since the reform and opening up, China has rapidly improved its industrial technology level and independent innovation capability by introducing advanced foreign technology and increasing investment in science and technology and human capital, and gradually narrowed the gap with developed countries.

China's experience in building a scientific and technological innovation system and enhancing its innovation capabilities are as follows:

First, China leads scientific and technological innovation with strategic planning. At the beginning of the reform and opening up in 1978, China had made an important judgment that *science and technology are productive forces*, and established the guideline that “economic construction must rely on science and technology, science and technology must be oriented towards economic construction”. From 1998 to 2006, with the acceleration of economic globalization, China implemented the strategy of rejuvenating the country through science and education and formulated the guidelines of “innovation and industrialization”. Since 2006, China had established the policy of “independent innovation, key leapfrogging, supporting development, and leading the future”; In 2012 China established an innovation-driven development strategy, and in 2016, established the “three-step” strategic goal of building a powerful country of scientific technological innovation by 2050 in the world. This policy opens a new journey for the future development of science and technology.

In the development of the national innovation system, China has always insisted on strengthening the close integration of science and technology and economy, strengthening the active role of innovation subjects, and paying attention to the training of scientific and technological personnel.

Second, promote technological progress with foreign investment policies. In the course of 40 years of development, the directional changes of foreign investment policies on technology introduction have promoted the technological R&D capabilities of enterprises. It has mainly experienced the gradual development from traditional technology upgrade to the introduction of new and high technology, and then to the independent research and development of core technology.

In the initial stage (1978-1986), the income tax reduction policy was mainly used to encourage the introduction of world advanced technologies in a joint venture manner, and the requirements for technology introduction were gradually defined in foreign investment policies (including the use of advanced equipment and scientific management methods, and foreign investment advantageous to technical transformation and training technical staff). The policy at this stage has a small role in promoting the introduction of technology.

During the development stage (1987-1993) the special economic zones and high-tech development zones were used as platforms to introduce advanced foreign technologies with positive fiscal measures. The high -tech enterprises in the zones were given preferential treatments such as tax reduction, import and export convenience, free pricing and other advantages, which greatly improved the speed of technology introduction.

When it came to the improvement phase (1994-2001), policies were formulated based on the differences in production technology, quality standards and advanced level of equipment in different industries to encourage foreign companies to carry out technological transformation and upgrading in China. After China's accession to the WTO (2001-2012), it emphasized the process of technology import, digestion and innovation, and restricted blind and repeated import. At the same time, it encouraged the establishment of R&D institutions overseas and the establishment of R&D alliances to develop technologies with independent intellectual property rights.

During the new phase (2013-now), China emphasizes the cooperation between research and development institutions, and emphasizes independent research and development and intellectual property protection. Under the guidance and support of policies, Chinese enterprises have gone through the process from processing production with supplied materials to attaching importance to R&D investment and intellectual property rights. The independent innovation capability of enterprises has been continuously improved.

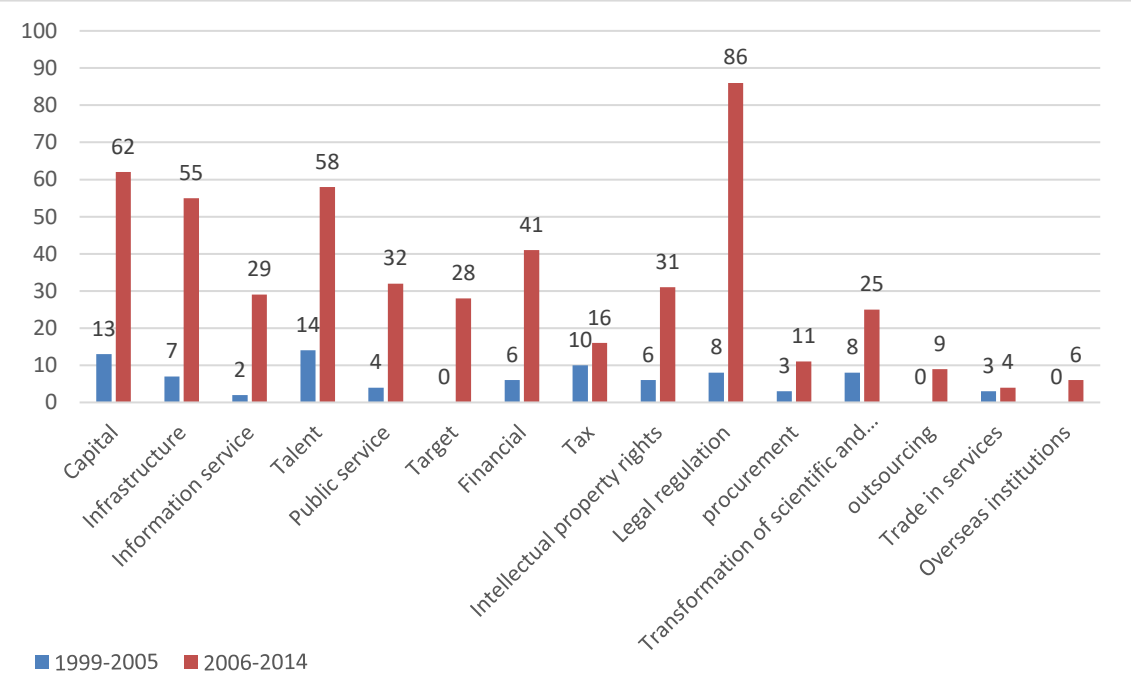
The third is to promote the development of Enterprise-University-Research Institute Cooperation with a variety of policy tools. China mainly adopts Supply-oriented policies (based on technology capital investment, scientific and technological personnel development and technology infrastructure construction), environmental policies (regulations, tax incentives, financial support and intellectual property protection) and demand-oriented policies (government procurement and transformation of scientific and technological achievements) in support of Enterprise-University-Research Institute Cooperation.

Judging from the historical process, in the early stage of the development of Enterprise-university-research institute cooperation, China tends to encourage tripartite cooperation through regulation and direct expansion of supply. Before 2006, policy tools mainly included investment in science and technology, cultivation of scientific and technological talents, and regulations in law, tax incentives and transformation of scientific and technological achievements. At this stage, scientific and technological innovation has made remarkable achievements. In the take-off stage, the environment-oriented policies

and demand-oriented policies were mainly applied, which were reflected in the use of a large number of regulatory policy tools since 2006. Meanwhile, financial support and intellectual property protection policy support were increased constantly. From 2006 to 2008, government procurement, service outsourcing, trade controls, and policy tools for overseas institutions were increased. After 2008, policy tools supporting the transformation of scientific and technological achievements continued to grow (Figure 12[2]).

From the perspective of implementation effects, environmental policies have a higher degree of positive impact on patent output, and demand-oriented policies have a greater impact on technology market turnover. Supply-oriented policies have a greater impact on the output of new products [3]。However, China's innovation policy also shows the over-dependence on supply-oriented policies, as well as the insufficiency of the environmental and demand-oriented policy tools such as financial support policies, government outsourcing, overseas institutions, etc.

Figure 12. Comparison of various Enterprises-University-research institutes Cooperation policy tools in different Phase



4. Implications and Suggestions for the Belt and Road partner countries

[2] Chen Panpan. Policy intensity, policy tool combination and regional innovation performance——An empirical study based on the cooperation policy of Enterprises, university and research institutes. Master's thesis.2017.

[3] Conclusions from the paper: Chen Panpan. Policy intensity, policy tool combination and regional innovation performance——An empirical study based on the cooperation policy of enterprises, university and research institutes. Master's thesis.2017.

4.1 Fully evaluate the advantages and actively participate in GVCs

Implement a strategy for integration into GVCs. The Belt and Road countries need to participate in the global value chain as a gateway to economic growth and transformation and upgrading. The enterprises of all sizes in developing countries, especially small and medium-sized enterprises, must actively participate in and make full use of global value chains to create more value. Due to the diversity of each economy's position and demand in global trade, the Belt and Road partners should actively participate in the global value chain and participate in targeted capacity building projects based on full understanding of their own advantages. Human resource development and technical cooperation with developed countries, will help narrow the gap in development levels and increase the share of value added in global value chains.

Emphasis on participation in regional value chains. At present, the development of global value chains has been characterized by regionalization and weakening of globalization. In the region, the “axle-spoke” model with the manufacturing power as the core has been formed. For developing countries, they should also actively participate in regional value chains to promote efficient and smooth value chain linkages within and between economies, and enhance regional resource integration capabilities. It is necessary to understand the market demand of countries and regions, and to deepen the industrial cooperation to achieve the division of labor in the regional value chain through industrial docking with other countries.

Help SMEs benefit from global value chains. The developing countries need to consider the needs of small and medium-sized enterprises, help them to strengthen capacity building in infrastructure, technological innovation, product standards, etc., and gradually improve the operational capabilities and competitiveness of small and medium-sized enterprises. The development of information and communication technologies also need to be strengthened in order to help SMEs to obtain trade and investment information more quickly to integrate into the value chain. SMEs should promote themselves to get in touch and cooperate with multinational companies.

4.2 Optimize trade structure and enhance GVCs level

Optimizing and upgrading of trade in goods. The developing countries need to attach importance to the development of foreign trade, strive to expand the scale of foreign trade, increase the added value of export products, increase the export of branded products, give play to the brand value-added effect, and improve profitability. Also they need to innovate the processing trade mode and promote the processing trade from the simple OEM production to the high-end extension of the industrial chain such as brand, R&D and settlement center. Moreover, new trade formats and functions need to be cultivated to form a competitive advantage in foreign trade with technology, brand, quality and service.

The innovation and development of trade in services. Trade in services plays an important role in the global value chain. The added value of unit service exports is much higher than that of goods trade, especially some high value-added services. However, the service industry foundation of developing countries is relatively weak, and the development of service trade is lagging behind the trade of goods. Therefore, developing countries should vigorously expand the scale of service trade, increase the proportion of service trade in foreign trade, and focus on cultivating service trades with high added value such as communication services, financial services, insurance services, and information services, and actively explore new information systems. The new

technologies such as big data, Internet, and cloud computing need to be considered and promoted.

4.3 Expanding openness and enhancing international competitiveness

Improve the level of openness of foreign trade. The developing countries need to take use of its comparative advantages, promote the export of superior products, and build an export-oriented industry. Under the concerns of economic security, industrial security and considering the dynamic development of the industry, the market access of goods trade need to be steadily expanded. In addition, they can consider signing free trade agreements with other countries, jointly reducing tariffs and non-tariff barriers with free trade partners, and opening up the trade of goods to each other to achieve mutual benefit.

Improve the level of openness of service sectors. The developing countries need to accelerate the development of service industry, take the industrial transformation and upgrading as the guide, and develop service industries such as industrial design, e-commerce, marketing and after-sales service, actively cultivate new service formats, and improve the specialization and internationalization of the service industry.

Improve the quality of foreign investment. They need to improve the investment environment and guide foreign investment in modern agriculture, new energy, new materials, information and communication, modern service industries, etc. In addition, they need to learn advanced technology and experience from multinational corporations to take use of the technological spillover effects of foreign-funded enterprises.

Strengthen international cooperation with Belt and Road partners. The Belt and Road countries can build an overseas industrial chain together to promote international cooperation in agriculture, construction, chemical, textile, automotive, communications under competitive advantages. So they can promote the export of domestic products and services through international cooperation, and improve their ability to participate in global value chains.

4.4 Adhere to innovation to achieve product, industry and technology upgrades

Pay attention to infrastructure construction and upgrading. The level of development of infrastructure is closely related to the economic development of a country, industrial upgrading, and inter-regional factor flows. For the Belt and Road countries, especially developing countries, infrastructure construction and upgrading have a significant positive impact on better integration into the global value chain system. So it is necessary to speed up the construction of transportation infrastructure such as roads, railways and ports, improve the electricity power system, promote the information and communication infrastructure, and increase investment in education and scientific research.

Improve the technical level and added value of products, from low-end to high-end. The developing countries need to learn advanced production technology, adopt international advanced quality standards, establish an internationally recognized product testing and certification system, and improve the quality and technical level of export products, such as agricultural products, home appliances, building materials and etc. Moreover, they need to improve the reputation of products. They need to pay attention

to three changes: change export products to high-end manufacturing and intelligent manufacturing, change enterprises from single production and processing to production service integration, and change the export from resource-intensive products to technical-intensive products.

Upgrade the industrial chain from manufacturing to investment and services. We suggest the developing countries to build a legal and international business environment to attract foreign investment, especially attracting advanced manufacturing and high-tech industries. And to attract foreign-funded enterprises to set up procurement centers, distribution centers and settlement centers to develop the headquarters economy in order to help local companies better integrate into global value chain division and production systems. They can also set up industrial parks in cooperation with other countries and encourage domestic enterprises to go abroad and extend the industrial chain in an orderly manner.

Focus on creating innovational and international enterprises in the GVCs. Through domestic development and integration of overseas resources, enterprises can be encouraged to deeply participate in international industrial division of labor, absorb advanced production factors, and cultivate internationally renowned brands. It is better to cultivate a group of multinational corporations with international visibility and influence that can extend the value chain. Meanwhile, encourage enterprises to increase investment in R&D and technological innovation, strengthen collaborative innovation cooperation with scientific research institutions and think tanks, and improve the level of automation and intelligence of enterprises. Some qualified and powerful enterprises can establish overseas production, processing and service systems, allocate resources on a global scale, open up markets, and improve their international competitiveness in resources, technology and market services. So they can fulfil the transformation from processing enterprise to technology, brand, and marketing-oriented enterprises.

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