

# The Impact of Technology Spillover Effect on China's Foreign Trade

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**Abstract**—As a major channel for technology spillovers, international trade has received widespread attention in the theoretical community in recent years. A large number of studies on how to determine and measure the technology spillovers brought about by international trade have yielded rich theoretical results and applied them to practice. The role of technology spillovers from developed countries in developing countries through trade for their productivity growth is increasingly receiving attention from developing countries. Since 2001, China's accession to the WTO has officially become a member of the WTO, and it has gained many opportunities to use technology spillovers. With the development of economic globalization and the acceleration and deepening of the internationalization of resource allocation, the "One Belt, One Road" concept and the Trans-Pacific Partnership Agreement (TPP), which are dedicated to the interconnection of the Asia-Europe and non-continent and nearby oceans, are being built. Today, economic concepts and relationship organizations have emerged as the times require. It is very important to understand and clarify the characteristics, forms and main principles of technological spillover effects of international trade. It is very important to understand the impact of technological spillovers on international trade.

**Keywords**—TFP, Technology Spillover Effect, International Trade

This paper firstly reviews and introduces China's foreign trade and development process, introduces the channels of international trade diffusion, and then uses the Cobb-Douglas production function to apply the fixed asset investment and fixed asset investment prices of the whole society from 1990 to 2015 in China. The index and other data are calculated and the total factor productivity is calculated. Based on this, the measurement analysis method is used to analyze the technology spillover effects from the four aspects of import trade, export trade, foreign direct investment and foreign direct investment. The impact and conclusions: Import trade and foreign direct investment promote the development of China's foreign trade through positive technology spillover effects; export trade and foreign direct investment promote the development of China's foreign trade through reverse technology spillover effects. Finally, based on the empirical results, and focusing on the development of foreign trade in China at the present stage and the characteristics of China's foreign trade, this paper puts forward relevant policy recommendations and opinions, and expects to improve and deepen the positive impact of foreign trade on the economy.

## I. INTRODUCTION

Foreign trade mainly refers to the exchange of tangible products or intangible products such as goods, labor and technology between two different countries, between two different regions or between countries and regions, mainly including import trade and export trade. Therefore, it is also known as "foreign trade" or "import and export trade." Different social systems determine the different nature and role of foreign trade. The earliest foreign trade in the world was born with the slave society and the feudal society. At that time, it was completely the exchange of tangible products. By the 21st century, the import and export of intangible products occupied the main share of foreign trade of all countries in the world.

### A. Research background

Foreign trade is an inevitable outcome of the development of human society to a certain historical stage. The emergence and continuous expansion of commodity production and commodity exchange and the formation of national society are two essential basic conditions for the formation of foreign trade. Today, in the 21st century, the whole world is an inseparable whole. As the economic globalization intensifies, the world economy is inseparable from the economies of the world. No country can be independent, and the most basic link between the economies of all countries is It is a trade relationship.

China's foreign trade began in the Qin and Han dynasties more than 2,000 years ago. It has been developed for a long time. The "Silk Road" opened by the Han Dynasty Zhang Qian can be regarded as a high point of China's early foreign trade. The prosperity of the "Maritime Silk Road" during the Tang and Song Dynasties was to push China's early rise in foreign trade to its peak. However, with the outbreak of the Opium War in 1840, China was forced to enter a semi-colonial and semi-feudal society. Foreign trade was completely controlled by the colonists, and the Chinese lost their sovereignty. After the founding of New China, especially after the reform and opening up, the implementation of the "introduction to go out" policy promoted the rapid development of China's foreign trade, making China a world foreign trade power and creating a miracle in the history of world trade development. At present, under the background of economic globalization, China is actively changing the growth mode of foreign trade and strives to realize the transformation from a large trading country to a trading power as soon as possible.

One of the channels of technology spillovers is international trade, and now academics and theorists are paying more and more attention to their research [1]. Since China joined the WTO in 2001, it has officially become a member of the WTO, and has gained many opportunities to use technology spillovers. With the development of economic globalization and the acceleration and deepening of the internationalization of resource allocation, the "One Belt, One Road" concept and the Trans-Pacific Partnership Agreement (TPP), which are dedicated to the interconnection of the Asia-Europe and non-continental and nearby oceans, are being built. Today, economic concepts and relationship organizations have emerged as the times require, to recognize and clarify the characteristics of technological spillover effects of international trade. Forms and main principles, etc. It is very important to understand the impact of technology spillovers on international trade.

### *B. Research purposes and significance*

In the perspective of development economics, the accumulation of capital and the advancement of technology are the focus of a country's economic growth. The key to whether a country's national economy is competitive is whether its technology is competitive. And a country's technological progress mainly includes the country's own research and development capabilities (R&D) and the absorption and learning of external technology, that is, technology spillovers.

After the industrial revolution, Western developed countries recognized the importance of technology, increased investment in research and development, and a product related to modern civilization was continuously introduced. In contrast, in the case of developing countries and developed countries, the former The ability of scientific research and development is far less than the latter. According to the data, we can find that the country with the largest R&D capacity in a country's GDP is the United States, followed by Japan. A high proportion of R&D investment has promoted the rapid advancement of technology in developed countries, and constantly develops high-tech and keep other countries far behind.. In comparison, developing countries headed by China are far less invested in R&D than Western developed countries for various reasons. Therefore, developing countries should pay attention to the importance of technology spillover effects and make better use of external technical resources. And learning, improve the absorption of technology spillovers, and continue to learn and emulate advanced technologies in developed countries and regions. Technology spillovers mean improving the technical level and productivity level of a place in a passive way [2]. At one time, whether technology spillovers were equal to whether or not the country's modernization was developed was generally equated. It is generally believed that a country's modernization must have a phenomenon of technological spillovers. In today's economic globalization, the core of the "backward advantage" in development economics is technology spillover. Nowadays, developing countries must pay attention to the technology spillover effect and learn and use technology spillovers if they want to catch up with the pace of developed countries.

Since the Third Plenary Session of the Eleventh Central Committee, China has gradually begun to open its doors and slowly eliminated barriers that hinder technology spillovers, enabling China to learn and use advanced world technologies to rapidly develop domestic technology. Economist Samuelson believes that the reason for China's economic growth is "to emulate the best technology in foreign countries." However, the learning and utilization of spillover technology also requires relative R&D funding, high-quality workforce talents, and relatively suitable mechanisms for innovation activities. Technology spillovers can relatively satisfy these related requirements. Therefore, we should pay more attention to technology. Overflow and make good use of [3].

## II. THE INTERNATIONAL TRADE DIFFUSION CHANNEL AND THE STATUS QUO OF CHINA'S FOREIGN TRADE DEVELOPMENT

### *A. International trade diffusion channel*

In recent years, with the deepening of China's economic internationalization, academic circles have increasingly studied China's acceptance of technology diffusion in internationalization, and it has become a trend to include multiple spillover channels into the analytical framework.

Since the beginning of the 21st century, with the deepening of economic globalization, scholars from all over the world have studied more and more foreign trade volume. It is widely believed that import trade, export trade, foreign direct investment and foreign direct investment are the main channels for the spread of international trade. Exports and imports are called trade channels, and foreign direct investment and foreign direct investment are called transnational direct investment channels, which are highly correlated [4].

### *B. China's foreign trade development status*

It has been nearly 40 years since the reform and opening up of the Third Plenary Session of the 11th Party in 1978. In the past 40 years, China has adhered to the basic national policy of opening to the outside world, actively participated in economic globalization, and joined the World Trade Organization in 2001. Further promote the policy of "going out and introducing". Over the past 40 years, China's foreign trade has continued to advance and has continued to develop and has made great progress.

In 1978, China's trade volume was only 20.6 billion U.S. dollars. However, in 2015, 40 years later, China's import and export of goods was 24.55 trillion yuan (\$3.95 trillion), of which exports were 14.12 trillion yuan (\$2.27 trillion). Imports were 10.44 trillion yuan (\$1.68 trillion) and the trade surplus was 3.68 trillion yuan. After the Asian economic crisis and the global economic crisis in 2008, the international economic turmoil, the international trade is sluggish, and the trade volume has been declining. However, in this context, China's trade volume of goods is still ranked first in the world, not only that, but also

China's foreign trade. Development has not regressed, further expanding China's international market share, improving and optimizing the structure of China's foreign trade, making China's foreign trade quality higher and better, and better and better.

Compared with 40 years ago, China's use of foreign capital has also achieved new breakthroughs. From 1978 to 1984, the seven years totaled 28.126 billion US dollars to 126.267 billion US dollars in 2015. This is not only a breakthrough in quantity, but also a qualitative leap. With regard to the use of foreign capital, China has always adhered to the principle of using foreign capital as the main principle. The opening of the domestic market is not blindly eager for success, but is carried out slowly and step by step. This helps China to avoid many open markets. The risks and problems brought about are very helpful to help China effectively deal with the financial crisis. The implementation of "bringing in and going out" has enriched China's participation in economic globalization and made it more diversified.

Since the Third Plenary Session of the Eleventh Central Committee in 1978, China has slowly opened its doors to the country and firmly grasped the opportunities of international manufacturing to accelerate its professionalism. Over the years, many countries, regions and enterprises have set their own processing bases in China, as well as neighboring countries. The demand for China's products has greatly promoted the development of China's export trade and improved the bilateral multilateral economic and trade relations between China and various trading countries. At the same time, after decades of development, the scale of China's economic and trade has been expanding. The huge population has allowed the countries of the world to tap the potential of China's foreign trade. More and more countries, regions and enterprises have chosen to enter China and China. As one of its goals for external development. Today, in the 21st century, the service industry that needs a large amount of labor is expanding its share of world trade. As a country with a large population, China has great demand for import and export of service trade. The development of China's service trade benefits from the development of world's service trade.

China's foreign trade has a broader market space. Since joining the direct trade organization, China's opening up to the outside world has been further expanded both in breadth and depth, and has changed from policy opening to institutional opening under the legal framework. As a member of the World Trade Organization, China actively promotes trade and investment liberalization and promotes the improvement of the multilateral trading system. This will provide a broad international market space for China to expand the development of export goods and service trade, and will also help internationally. The market has access to domestically scarce resources and technology.

Technological innovation and financial reform will create favorable conditions for the development of foreign trade. The acceleration of industrial transfer provides us with a large number of opportunities to obtain external technology and improve research and development capabilities, which is conducive to strengthening China's "post-development advantage" and improving China's international competitiveness. The opening up of finance is conducive to drawing on international experience, strengthening international financial cooperation, further improving China's financial system, and using international financial markets to promote domestic economic and trade development [5].

### III. EMPIRICAL ANALYSIS

The empirical analysis of technology spillover effects in this chapter mainly includes measuring and estimating total factor productivity, and analyzing the impact of technology spillover effects on total factor productivity (TFP).

This paper mainly uses the Cobb-Douglas production function method to estimate total factor productivity (TFP).

Assume that the production function of the Chinese economy is [6]:

$$Y=A \times K^{\alpha} \times L^{\beta} \quad \text{Equation 4.1}$$

Transform the equation into:

$$A=Y/(K^{\alpha} \times L^{\beta}) \quad \text{Equation 4.2}$$

This leads to:

$$TFP=GDP/(K^{\alpha} \times L^{\beta}) \quad \text{Equation 4.3}$$

Taking the logarithm of Equation 1, you get:

$$\ln Y=\alpha \times \ln K+\beta \times \ln L+\mu \quad \text{Equation 4.4}$$

Suppose the return to scale is the same, that is,  $\alpha+\beta=1$

$$\ln (Y / L)=\alpha \times \ln (K / L)+\mu \quad \text{Equation 4.5}$$

#### A. Data selection

Through the China Statistical Yearbook 2016 published by the National Bureau of Statistics, we can sort out China's nominal GDP and the 1978-based GDP index. The GDP index of the previous year's GDP is converted into real GDP by the 1978 base period. The calculation formula is as follows:

$$\text{Real GDP} = \text{nominal GDP} / \text{GDP index based on 1978 (GDP deflator)} \quad \text{Equation 4.6}$$

Through the China Statistical Yearbook 2016 published by the National Bureau of Statistics (employment data from 1991-1994 comes from the China Statistical Yearbook 2002), we can sort out the actual GDP, total social fixed assets investment, and fixed asset investment from 1990 to 2015. Price index, fixed capital stock and employment.

The data shows:

1)The total national economy Y. This paper uses the expenditure method to measure the total national economic output Y according to the actual GDP converted from the GDP of the year 1978 in the China Statistical Yearbook 2016 published by the National Bureau of Statistics. The conversion formula is Equation 4.6.

2)Number of employed persons L. The number of employed persons in this paper was selected from the statistics of employment in China Statistical Yearbook 2016 published by the National Bureau of Statistics (employment data from 1991-1994 from China Statistical Yearbook 2002).

3)Fixed capital stock K.

(1)A method for calculating the fixed capital stock K. At present, there are many methods for measuring the stock of fixed capital in the academic world. The more ones adopted are the ones proposed by He Juhuang [7] in the "Estimation of China's Assets" published in 1992:  $K_t = K_{t-1} + I_t$  The accumulation of the t-th year (where  $K_t$  represents the fixed capital stock in the t-th year,  $K_{t-1}$  represents the fixed-cap stock in the t-1 year); the second is proposed by Zou Zhizhuang [8]:  $K_t = K_{t-1} + I_t$  The actual net investment for the t-year. This article uses the basic formula that is now widely adopted by OECD countries:

$$K_t = K_{t-1} * (1 - \delta_t) + I_t \quad \text{Equation 4.7}$$

(2)Selection of the base period capital stock  $K_0$ . The data of 1952, 1978 and 1980 are several options for predecessors. The reference to Wang Hui [9] directly uses the capital stock value of 1192 billion yuan (the price unchanged in 1978) at the end of 1978 as the initial capital value.

(3)Determination of the economic depreciation rate  $\delta$ . This paper uses the annual depreciation rate of China's fixed capital depreciation rate measured by Dr. Zhang Jun [10] using the perpetual inventory method (PIM method), which is  $\delta=9.6\%$ .

(4)Determination of the fixed asset investment price index. This paper selects the fixed asset investment price index with 1990 as the base period (which is 1990=100) in the China Statistical Yearbook 2016 published by the National Bureau of Statistics, and calculates the fixed period of 1990 based on Wang Hui. The asset investment price index is 184.4, and the fixed asset investment price index based on 1978 is calculated. The specific calculation formula is:

$$\text{Fixed Assets Investment Price Index with 1978 as the base period} = \text{Fixed Assets Investment Price Index with 1990 as the base period} * 1.848 \quad \text{Equation 4.8}$$

(5)Determination of investment in the t-year. This paper adopts the perpetual inventory method, and passes the fixed assets investment of the whole society in the China Statistical Yearbook 2016 published by the National Bureau of Statistics, and converts it into the actual value expressed by the constant price of 1978 through the fixed asset investment price index. The specific calculation formula is as follows:

$$I_t = \text{The whole society fixed assets investment} / \text{fixed asset investment price index based on 1978} \quad \text{Equation 4.9}$$

TABLE I. RESULTS OF REGRESSION ANALYSIS

Dependent Variable: Y				
Method: Least Squares				
Date: 03/22/17 Time: 20:53				
Sample: 1990 2015				
Included observations: 26				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
K	0.223726	0.021272	10.51745	0.0000
C	-1.689426	0.026040	-64.87720	0.0000
R-squared	0.821716	Mean dependent var		-1.623403
Adjusted R-squared	0.814288	S.D. dependent var		0.299029
S.E. of regression	0.128864	Akaike info criterion		-1.186308
Sum squared resid	0.398545	Schwarz criterion		-1.089532
Log likelihood	17.42201	Hannan-Quinn criter.		-1.158440
F-statistic	110.6168	Durbin-Watson stat		1.650880
Prob(F-statistic)	0.000000			

DW value = 1.59, then find the sample size 26, the independent variable is 1, the upper limit of the DW value is 1.46 when the significant level is 5%, the lower limit is 1.3,  $DW=1.65>1.46$ , so the model is disabled. The difference sequence has no autocorrelation.

The interpretation of the regression results is as follows:

According to the relationship determined by Equation 4.5, the generalized linear regression of the sample data is performed. As can be seen from Table I,  $R_2$  is 0.822, indicating that the interpretation degree of the corresponding variable of the model is 82.2%,  $F=110.62$ , and the probability is 0, less than 0.1, indicating that the regression equation has significant linear properties. The fixed K/L coefficient is  $0.22>0$ , indicating that K/L is positively correlated with gross domestic product (GDP), but the impact of K/L on gross domestic product (GDP) is not significant, and K/L is increased by 1 each. Units, gross domestic product (GDP) increased by 0.22 units.

According to the regression results, we can draw  $\alpha=0.22, \beta = 1 - \alpha = 0.78$

Therefore, according to formula 4.3, we can get the 1990-2015 fixed capital stock, employment, TFP, TFP index (1978 price)

Among them, we have a TFP index of 100 in 1990, and the TFP index in the t-year is:

$$TFP \text{ index} = TFP_t / TFP_{1990} * 100 \quad \text{Equation 4.10}$$

### B. Model Construction

The technology spillover effect is mainly affected by the four aspects of import, export, foreign direct investment and foreign direct investment.

$$\ln TFP = \gamma_1 * \ln IM + \gamma_2 * \ln EX + \gamma_3 * \ln FDI + \gamma_4 * \ln OFDI + \gamma_5 * \ln GDP + \mu \quad \text{Equation 4.11}$$

Through the China Statistical Yearbook 2016 published by the National Bureau of Statistics, the 2015 China Foreign Direct Investment Statistics Bulletin published by the Ministry of Commerce, and the UNCTAD World Investment Report, we can sort out the total exports and imports of China from 1990 to 2015. Total, foreign direct investment and foreign direct investment data.

The data was regressed using Eviews7.0 software. The regression results are as follows:

TABLE II. REGRESSION ANALYSIS RESULTS

Dependent Variable: Y				
Method: Least Squares				
Date: 03/22/17 Time: 21:03				
Sample: 1990 2015				
Included observations: 26				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EX	-0.322405	0.138626	-2.325723	0.0307
IM	0.123806	0.132686	0.933080	0.0019
FDI	0.074530	0.041588	1.792117	0.0883
OFDI	-0.060220	0.012262	-4.911116	0.0001
GDP	0.912817	0.187376	4.871579	0.0001
C	-8.561862	1.254487	-6.824993	0.0000
<b>R-squared</b>	<b>0.889309</b>	<b>Mean dependent var</b>	<b>-1.688327</b>	
<b>Adjusted R-squared</b>	<b>0.861637</b>	<b>S.D. dependent var</b>	<b>0.126341</b>	
<b>S.E. of regression</b>	<b>0.046995</b>	<b>Akaike info criterion</b>	<b>-3.078356</b>	
<b>Sum squared resid</b>	<b>0.044172</b>	<b>Schwarz criterion</b>	<b>-2.788026</b>	
<b>Log likelihood</b>	<b>46.01862</b>	<b>Hannan-Quinn criter.</b>	<b>-2.994751</b>	
<b>F-statistic</b>	<b>32.13679</b>	<b>Durbin-Watson stat</b>	<b>2.112072</b>	
<b>Prob(F-statistic)</b>	<b>0.000000</b>			

DW value = 2.11, then find the sample size 26, the independent variable is 5, the upper limit of the DW value is 1.88 when the significant level is 5%, the lower limit is 0.98,  $4-DW=1.89>1.88$ , so the model The middle residual sequence has no autocorrelation.

The interpretation of the regression results is as follows:

According to the relationship determined by Equation 4.11, the generalized linear regression is performed on the sample data. As can be seen from Table II,  $R_2$  is 0.889, which indicates that the interpretation degree of the independent variable of the

model is 88.9%,  $F=32.14$ , and its probability is 0, less than 0.1, indicating that the regression equation has significant linear properties. The coefficient of total export is  $-0.32 < 0$ , indicating that the total export value is negatively correlated with total factor productivity, but the impact is not significant. The coefficient of total imports is  $0.12 > 0$ , indicating that total imports are positively correlated with total factor productivity, but the impact is not significant. The coefficient of foreign direct investment is  $0.07 > 0$ , indicating that foreign direct investment is positively correlated with total factor productivity, but the impact is not significant. The coefficient of foreign direct investment is  $-0.06 < 0$ , indicating that foreign direct investment is negatively correlated with total factor productivity, but the impact is not significant. The coefficient of gross domestic product is  $0.91 > 0$ , indicating that gross domestic product is positively correlated with total factor productivity, and the impact is relatively significant.

#### IV. CONCLUSIONS AND PROSPECTS

The impact of technology spillovers on a country's foreign trade has been widely recognized by various scholars. This paper uses total factor productivity (TFP) as an independent variable, import, export, foreign direct investment and foreign direct investment as independent variables. Regression analysis, the main conclusions were drawn.

##### A. Main Conclusions

**1.Import trade promotes the development of China's foreign trade through positive technology spillover effects.** The impact of import trade on technology spillover effects is mainly through the introduction of effects and learning effects. The introduction of the effect means that the importing country introduces advanced technology into the country by importing advanced products and machines, thereby using these competitive products and technologies to improve the country's own technical level. China imports China's technology-intensive, technology-intensive products and production equipment to promote China's domestic production efficiency and research and development efficiency, and improve China's domestic product quality, improve product competitiveness, and thus promote the development of China's foreign trade. The learning effect refers to the production of similar products through the analysis, learning and imitation of imported products. At the beginning of technology export, imitation is a major way of technological progress; through continuous exploration, continuous accumulation of experience and knowledge, and improvement of its production capacity, thereby enhancing product advantages and promoting foreign trade.

**2.Export trade promotes the development of China's foreign trade through reverse technology spillover effects.** The reverse technology spillover effect refers to the technology transfer behavior of the host country through the foreign direct investment and international trade to the external economy of the host country. As a product exporter, its products must compete with products from all over the world. In order to win, it must provide high-quality and low-cost products. This requires domestic export enterprises to continuously improve the quality and technology of their products and improve their products. Competitiveness to meet the needs of the importing countries. In addition, some multinational companies will provide technical assistance to export enterprises in order to obtain products that meet their own quality requirements. Domestic enterprises can therefore enjoy assistance higher than domestic technical standards, enhance product production efficiency and quality, and thus promote the development of China's foreign trade.

**3.Foreign direct investment promotes the development of China's foreign trade through positive technology spillover effects.** Foreign direct investment promotes the improvement of labor capital and the improvement of labor skills through the training of multinational corporations and the flow of personnel; and the management model and products of foreign direct investment will form a good demonstration for local enterprises after entering the country. Enterprises continue to learn and imitate, and improve their own management and research and development efficiency; foreign direct investment can also promote the vertical extension of the local enterprise industry through the cooperation with local enterprises, and form a post-external chain; and due to the participation of foreign businessmen, it will promote The competition in the local market promotes local companies to constantly improve their products to obtain a piece of the market. When foreign direct investment enters China, it will directly or indirectly encourage domestic enterprises to actively improve their management mode and production mode, and break the mode of domestic enterprise comfort, enhance the competitiveness of the domestic market, and make domestic enterprises have a sense of urgency. Constantly improve yourself.

**4.Foreign direct investment promotes the development of China's foreign trade through reverse technology spillover effects.** Multinational corporations are one of the main modes of foreign direct investment. Through foreign direct investment, multinational companies have expanded their overall market size, thereby apportioning their own R&D costs, reducing their costs while continuously improving their competitiveness; at the same time, overseas subsidiaries of multinational companies use the capital of the host country. And Jiyuan conducts research activities, and feeds the research results to the parent company, and then transfers various new technologies to subsidiaries located in different countries through a core institution such as the parent company, thereby realizing sharing of resources and sharing of technologies, and the use of minimum The resources invested in obtaining the most technical achievements [11]. Moreover, the form of foreign direct investment can help domestic enterprises better understand the information on the international market and foreign technology resources, and help the enterprises to complement and collaborate on a global scale, thus helping domestic enterprises to absorb and learn international advanced knowledge and In order to improve their own level, information will further promote the development of China's foreign trade.

## *B. Policy Recommendations*

### **1. Vigorously adjust the structure of foreign trade commodities**

#### (1) Import and export are equal

Since the Third Plenary Session of the Eleventh Central Committee in 1978, because of the international foreign exchange restrictions, in the early stage of developing foreign trade, in order to store more foreign exchange, China has adopted a policy of encouraging export innovation, attaching importance to exports and neglecting imports. The behavior is based on the increase of foreign exchange reserves, but neglects that import trade also promotes the development of China's foreign trade. Therefore, in the development of foreign trade, China should not only focus on exports, but should also pay equal attention to imports and exports, and give full play to the role of imports and exports in promoting China's economy.

#### (2) Further optimize the structure of import and export commodities

By consulting China's statistical yearbook and other data, we can find that China's current export focus is still labor-intensive products and the focus of imports is still technology-intensive products, but entering the 21st century, the importance of technology is getting more and more attention. Therefore, China should attach importance to improving product technology, implement incentive policies in improving technology, promote the improvement of China's product technology level, increase the proportion of technology-intensive products in exports, and reduce its proportion in imported products.

### **2. Make full use of the technology spillover effect of foreign trade**

Nowadays, all the resources in the world are limited, but the progress of science and technology is indeed endless and can continue to develop like this. Therefore, the focus of economic development must be slowly shifting from resource input to relying on technology. China's technological progress has been greatly improved since the reform and opening up in 1978, but there is still a certain gap compared with the developed countries in the West. To promote the development of China's foreign trade and economic growth, we must make full use of the technology spillover effect, imitate and learn the production mode of advanced countries' products in the western developed countries, improve the production efficiency and improve the quality of products, and learn advanced Western enterprises. The business management model and methods to improve their competitiveness.

At present, China, like other developing countries, has the problem that technology introduction expenditures far exceed independent research and development expenditures, and independent research and development expenditures are obviously insufficient. The lack of independent research and development expenditures makes China's introduction of advanced technologies and products not well digested and absorbed, and cannot fully understand the production principles of advanced technologies and products introduced, which greatly affects China's introduction of technology. Innovation. Therefore, it is necessary for China to increase self-sufficient R&D expenditures, promote domestic special research on imported advanced technologies and products, and improve its ability to digest and absorb, thus enhancing China's ability to innovate.

### **3. Improve the supply structure of human capital**

Studies have shown that international technology spillovers need to be transmitted through human capital, and human capital is the medium through which it is carried out. In the same way, human capital can fully learn the spillover technology and obtain the technology spillover effect in the process of transmission. Only when domestic enterprises have certain learning, imitation and absorptive capabilities can they make full use of the opportunities brought about by technology spillovers, continuously improve the technical level of their products, and improve the competitiveness of their products, thereby further enhancing the market competitiveness of domestic enterprises. Therefore, one of the keys to obtaining the technology spillover effect of international trade is to increase investment in human capital. In China, there are still problems of low labor quality and insufficient capacity. Therefore, while paying attention to the growth of human capital, China must pay attention to the growth of human capital. This requires China to continue to popularize basic education, reduce the illiteracy rate of the national labor force, pay equal attention to vocational and technical education and higher education, continuously improve the enrollment rate of postgraduate education, and focus on the cultivation of innovative and high-quality talents.

### **4. Improve trade openness**

The impact of technology spillovers on transnational direct investment channels and trade channels on China's foreign trade is mutually reinforcing. We should expand our foreign trade openness while improving the development of foreign trade through improving import and export commodity structure and human capital structure. The technological spillover effects of foreign direct investment and foreign direct investment can better promote the development of China's foreign trade [12].

As is known to all, transnational direct investment channels enhance China's total factor productivity through training effects, demonstration effects, correlation effects, and competitive effects, thus promoting the development of China's foreign trade. Increasing the degree of trade development can promote the absorption, application and innovation of domestic enterprises' information, knowledge and technology. The absorption of information technology by a company is not only related to the stock of knowledge owned by enterprises, but more importantly, the stock of knowledge of the outside world. Increase the openness of foreign trade, allow more foreign companies to enter China, bring in advanced management models

and technological levels, and at the same time, more Chinese companies will go out and learn about the world's new knowledge and new technologies. To improve their own level and improve China's foreign trade.

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