The Impact of Sino-Us Trade War on China's High-Tech Industry

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Abstract—The outbreak of Sino-US trade war broke the original operation mode of international trade market, making the already tense international trade form more severe. Affected by this, the trade direction and trade mode of China's high-tech industry are quietly changing. After collecting and sorting out relevant materials, this paper mainly analyzed the causes of the Sino-US trade war, including the serious trade deficit between China and the US, the threat of the rapid development of China's economy to the HEGEMONY of the US and the development of China's high-tech industry. And we analyzed the impact of the trade war on China's high-tech industry. Based on the difficulties faced by the high-tech industry, we propose to improve the ability of core technology innovation and achievement transformation; vigorously develop new infrastructure construction; enhance the flexible upgrade of high-tech products export supply chain and establish a positive circular penetration system for high-tech product and service exports as a response strategy.

Keywords-high and new technology industry; coping strategy; Sino-US

1 INTRODUCTION

The trade war between China and the US began in 2018. China and the US imposed import tariffs on each other in 2018-2019, which adversely affected both countries. On January 15, 2020, Sino-US relations moved towards detente, and representatives of both sides jointly attended the signing ceremony of the first economic and trade agreement. But the economic, technological, and geopolitical competition between China and the United States, whether friendly or not, can be seen as long-term competition. This will be the "new normal" for the next 10 to 20 years.

Will competition between China and the United States lead to war? China has no intention of promoting its ideology or system of government to other countries, The US only wants to defend its hegemonism and power politics by weakening China's international status. Therefore, the relationship between the two countries must be carefully managed and advanced.

2 THE CAUSES OF THE SINO-US TRADE WAR

To a large extent, the Sino-US trade is being pushed by the United States unilaterally on its own initiative, while China is fighting back passively. There are three main reasons for the trade war between China and the US. One is the serious trade deficit between China and the US; the other

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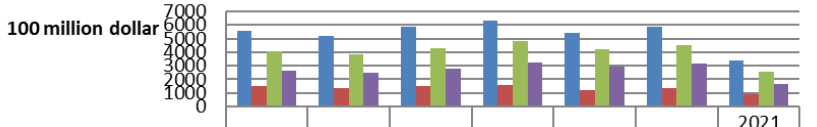
is the rapid rise of China's economy, which threatens the global hegemony of the US; and the third is the development of China's high-tech industry. Therefore, the United States unilaterally believes that provoking a trade war and imposing sanctions on Chinese imports and exports can effectively reverse the long-term unfavorable situation for the United States trade, which can not only increase trade revenue for the United States Treasury, but also maintain its hegemonic position in the world.

2.1 There is a serious trade deficit between China and the US

Surveys show that China has a long-standing trade deficit with the United States. According to the data provided by the Ministry of Commerce, the total import and export volume of bilateral goods between China and the United States in 2020 was 586.721 billion dollars, among which the import value was 134.908 billion dollars, the export value was 451.813 billion dollars, and The US trade deficit with China reached $316.905 billion. By the end of the first half of 2021, China's trade surplus with the United States reached $164.922 billion. As can be seen from Figure 1, in recent years, China's import and export trade surplus with the United States has been over $250 billion. The United States has not put forward effective strategies to deal with the widening gap, so it unilaterally instigated a trade war in an attempt to recover the losses caused in the trade war.

As a matter of fact, the reason for the US to wage a trade war is its long-standing and huge trade deficit with China. However, a trade war will not reverse this trend. On the contrary, it will disrupt the international trade market and undermine international economic development. Statistics show that the trade war has a big impact on the US. The US had hoped to raise tariffs on Chinese imports to narrow its trade deficit, but the trade deficit with China has actually increased, and China still has the largest trade surplus with the US among all its trading partners.

The formation of Sino-US trade deficit is essentially due to differences in the international division of labor between China and the US. China has long relied on demographic advantage to process imported materials and then export them to other countries in the world, while the role of the United States is responsible for exporting unassembled raw materials to China.[1]



	2015	2016	2017	2018	2019	2020	2021.6
import-export volume	5582.75	5194.87	5836.97	6335.19	5413.88	5867.21	3408.06
import volume	1487.34	1344.02	1539.43	1550.96	1227.14	1349.08	879.42
export volume	4095.38	3850.85	4297.54	4784.23	4186.74	4518.13	2528.64
trade gap	2608.04	2506.83	2758.11	3233.27	2959.6	3169.05	1649.22

Figure 1. China's trade with the United States from 2015 to the first half of 2021 imports, exports, total imports and exports

Note: The data are from monthly statistical reports of the Department of Statistics and Analysis of the General Administration of Customs, PRC

2.2 China's economy threatens US hegemony

Some Americans worry that the United States may not be able to maintain its hegemony in the world as China rises. Moreover, a rapidly rising China has become a potential economic competitor to the United States. In 2000, China's GDP was only 18.7 percent of that of the US, but First Half of 2021, China's GDP was 74.3 percent of that of the US. In 2020, China's economy exceeded 100 trillion yuan for the first time, which is a milestone for China. Meanwhile, in first Half of 2021, China's economy is growing at a real annual rate of 12.7%, compared with America's 6.2% (see Figure 2). If current trends continue, China's gross domestic product (a measure of economic development) will catch up the United States around 2028.

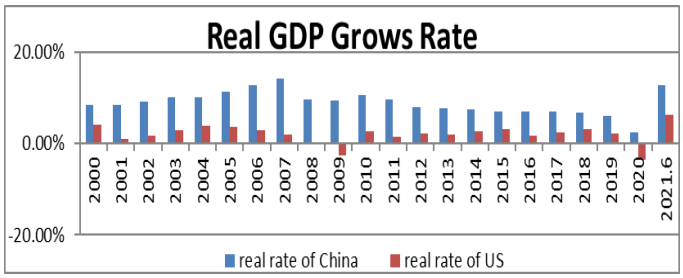


Figure 2. Real GDP growth in China and the US

Note: The data come from China's National Bureau of Statistics and the U.S. Bureau of Statistics

2.3 The development of China's high-tech industry

In addition, although China's technology in general still lags behind that of the United States, China has made great progress and even surpassed the United States in many areas, including 5G mobile communication technology, artificial intelligence applications, quantum communication and satellite navigation. We will discuss this in depth in our paper.

3 THE IMPACT OF SINO-US TRADE WAR ON CHINA'S HIGH-TECH INDUSTRY

3.1 Us sanctions on Chinese high-tech enterprises

Look at the Us sanctions on Chinese science and technology companies, the US "company war" against China, in addition to the sanctions on ZTE (in April 2018, the US Department of Commerce issued an export permission ban on ZTE) and the ban on Fujian Jinhua Company (in October 2018, The US Department of Commerce identified Fujian Jinhua Company as engaging in activities that violate THE national security interests of the US on the grounds of allegedly stealing intellectual property rights of Us enterprises, and include it in the entity list of export Administration Regulations)[2].

Third, the attack on Huawei (in December 2018, The US government has asked Canada to detain Huawei's chief financial officer and seek his extradition to the US. This is mainly because the development of Huawei has affected the hegemony of the US high-tech industry. In

May 2019, the US imposed sanctions on Huawei and its 70 affiliates, restricting sales of technology products to Huawei) and imposed sanctions on the following companies (see figure 3), which are mainly engaged in high-tech industries.

1 Armyfly
2 Beijing E-science Co., Ltd.
3 Beijing Geling Shentong Information Technology Co., Ltd.
4 Beijing Hileed Solutions Co., Ltd.
5 Beijing Sinonet Science & Technology Co., Ltd.
6 Chengdu Xiwu Security System Alliance Co., Ltd.
7 China Academy of Electronics and Information Technology
8 Hangzhou Hualan Microelectronics Co., Ltd.
9 nfo Rank Technologies
10 Kindroid
11 Kyland Technology Co., Ltd.
12 Leon Technology Co., Ltd.
13 Shenzhen Cobber Information Technology Co., Ltd.
14 Shenzhen Hua'antai Intelligent Technology Co., Ltd.
15 Suzhou Keda Technology Co., Ltd.
16 Tongfang R.I.A. Co., Ltd.
17 Urumqi Tianyao Weiye Information Technology Service Co., Ltd.
18 Wingel Zhang
19 Wuhan Raycus Fiber Laser Technologies Co., Ltd.
20 Xinjiang Beidou Tongchuang Information Technology Co., Ltd.
21 Xinjiang Lianhai Chuangzhi Information Technology Co., Ltd.
22 Xinjiang Sailing Information Technology Co., Ltd.
23 Xinjiang Tangli Technology Co., Ltd.

Figure 3. List of Controlled Companies (part)

Note: Data drive from the U.S. Department of Commerce

①[7], [21], [12], [13], [22], [3], [16], [14], [6], [5], [17], [15], [23] the above entities are mainly domestic enterprises in the fields of artificial intelligence (including face recognition, etc.), security monitoring and public safety system services.

②[11] is the main maker of EPA standard, the first international standard in the field of industrial control in China. It is one of the thirteen computer and network communication enterprises. It is the only provider of industrial Ethernet switch equipment with independent intellectual property rights in China.

3.2 Dependence on the US for key technologies

China is somewhat dependent on the United States for key technology imports[3].At present there are many enterprises in China there is no independent research and development institutions and the phenomenon of insufficient innovation ability exists in China's high-tech industry. In order to solve these problems, they usually choose direct purchase application in the United States. Except for a few high-tech companies with core technologies, most of

Chinese high-tech products are dependent on imports. And many of the high-tech products China needs generally have core technology that only the United States holds. Therefore, the sanctions imposed by the United States on Chinese high-tech companies will have a huge impact on the development of China's high-tech industry[4]. If Chinese choose to import high -tech products from other countries, it will also increase the import cost of China's high-tech products.

3.3 An in-depth analysis of China's high-tech industry

From overall, from 2015 to 2021 in the first half of China's imports and exports of high-tech products, except a slight decline in 2016 and 2019-mainly by the trade friction and the impact of a slowing world economy-the overall high and new technology industry imports and exports, there is a growing trend. Moreover, exports have always been greater than imports, and high-tech industries have a trade surplus. As can be seen from figure4, from 2015 to 2020 for China, the export of new high-tech product increased from 655.2 billion dollars to 776.7 billion dollars, imports increased from us $548.1 billion to US $682.2 billion .By the first half of 2021, the export of new high-tech product was 438.2 billion dollars, the export of high-tech products increased by 33.50 percent from January to June of last year, and the import value was 338.4 billion dollars, the amount of imports from January to June of last year increased by 29.40 percent, China's position as the largest trading country has become more stable. This is mainly due to the state's strong support for the high-tech industry, which mainly includes the following points: First, the state implements preferential policies for the high-tech industry to create a good development environment, so that China's core technology onto the fast track; The second is the implementation of 12-year compulsory education, training high-quality talents, for China's core technology innovation to lay a foundation; Third, a large amount of capital flows into high-tech industries, thus stimulating the exploration and innovation of core technologies. This is an important decision made by the CPC with a global vision, a global perspective and a future-oriented perspective. Thus promoted the development of China's core technology in recent years.

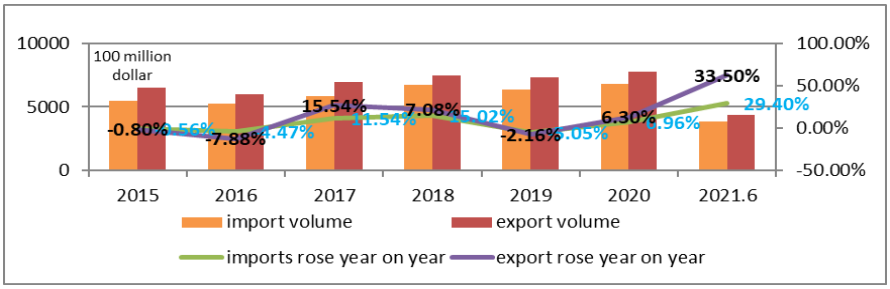


Figure 4. Import volume, export volume and Growth ratio of China's high-tech products from 2015 to the first half of 2021

Note: The data are from monthly statistical reports of the Department of Statistics and Analysis of the General Administration of Customs, PRC

In terms of technology, computer and communication technology and electronic technology are still the main products from January to October 2021. The export of computer and communication technology is still dominant. In October 2021, the export of computer and

communication technology reached 54.071 billion US dollars, up 2.59% from 52.702 billion US dollars in September. Electronics imports ranked second with 39.889 billion dollars as of October 2021, down 14.84 percent from the previous month. Except for February, the export of electronic technology increased steadily from 17.386 billion dollars in January to 21.973 billion dollars in October. Imports of computer and communications technology fluctuated around $12 billion from January to October 2021. However, biotechnology, optoelectronics and aerospace technologies account for a relatively small share of the import and export trade (see figure 5).

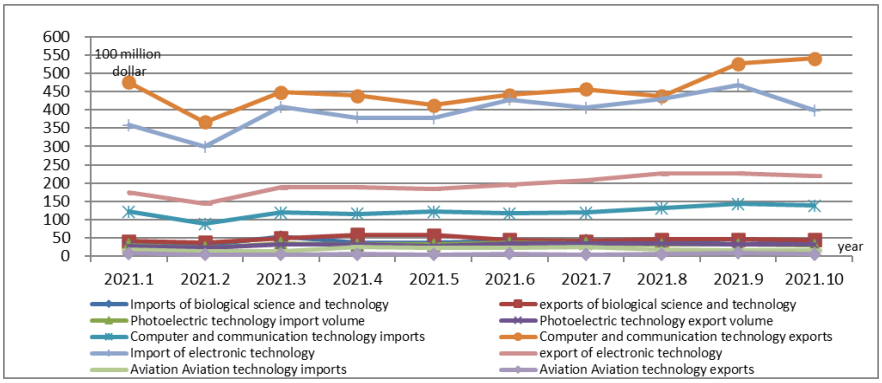
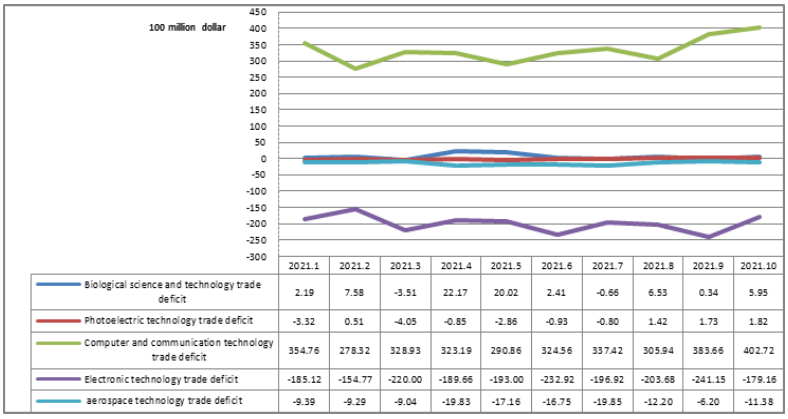


Figure 5. Imports and Exports of China's high-tech industry from January to October 2021

Note; The data come from the Statistical Analysis Department of the General Administration of Customs, PRC

From the perspective of the trade balance of the core high-tech industry, computer and communication technology have been in trade surplus from January to October 2021. By October 2021, the trade balance of computer and communication technology was as high as 40.272 billion dollars, and the trade balance from January to September 2021 was also over 27 billion dollars. This illustrates the recent rapid development of computer and communication technology. At present, China's 5G technology has certain technical advantages, which speeds up the construction process of computer and communication technology[5]. Unlike computers and communications technology, electronics had a trade deficit of $17.916 billion from January to October 2021, and the rest of 2021 had a trade deficit of more than $15 billion (see Figure 6). This series of data shows that China's electronic technology is still in a weak stage at the present stage, and China introduces technology from other countries to make up for the lack of electronic technology development trend. The trade balance of biological science and technology, photoelectric technology and aerospace technology was small.



	2021.1	2021.2	2021.3	2021.4	2021.5	2021.6	2021.7	2021.8	2021.9	2021.10
Biological science and technology trade deficit	2.19	7.58	-3.51	22.17	20.02	2.41	-0.66	6.53	0.34	5.95
Photoelectric technology trade deficit	-3.32	0.51	-4.05	-0.85	-2.86	-0.93	-0.80	1.42	1.73	1.82
Computer and communication technology trade deficit	354.76	278.32	328.93	323.19	290.86	324.56	337.42	305.94	383.66	402.72
Electronic technology trade deficit	-185.12	-154.77	-220.00	-189.66	-193.00	-232.92	-196.92	-203.68	-241.15	-179.16
aerospace technology trade deficit	-9.39	-9.29	-9.04	-19.83	-17.16	-16.75	-19.85	-12.20	-6.20	-11.38

Figure 6. Trade deficit of China's China's high-tech products from January to October 2021

Note; The data come from the Statistical Analysis Department of the General Administration of Customs, PRC

4 COPING STRATEGY

Under the background of trade friction, the measures to deepen the export of China's high-tech industrial products are as follows: Improving the core technology research and development and achievement transformation mechanism; New infrastructure to drive the improvement of China's innovation capacity; Promote the flexible upgrade of high-tech export supply chain; Establish a positive circular promotion system for the export of high-tech products and services.

4.1 Improve the innovation ability of core technology and achievement transformation mechanism

In the context of new infrastructure, China's 5G, industrial Internet, new energy and other technologies have strong international competitiveness. Technological research and innovation is the guarantee. At present, the space for acquiring core technologies through purchase, market exchange and other means is increasingly narrow. Therefore, China needs to further improve the core technology research and development and innovation mechanism. In view of the low conversion rate of existing high-tech achievements, on the basis of the government's leadership, strengthen the connection between the supply and demand of achievement transformation, build the achievement transformation platform with multiple subjects participation, and finally realize the three-dimensional docking between technological innovation, industrial innovation and export trade.

4.2 Drive the progress of core technologies in China with new infrastructure

Export diversification of new technology products and new infrastructure are the key to enhancing economic competitiveness in China's digital era, as well as the foundation for the development of digital industry. At present, China has certain technological advantages in 5G technology, big data, satellite navigation, Internet of Things, industrial Internet and other

fields. We should accelerate the construction of infrastructure in these areas to seize the commanding heights of the global digital economy and support stable investment and consumption. In the process of digital transformation, China's high-tech enterprises should make full use of e-commerce platforms, actively integrate into the global digital trade system, and constantly explore markets in Latin America, Africa, central and Eastern Europe and other countries.

4.3 Promote the flexible upgrade of the export supply chain of high-tech products

The epidemic has caused a great impact on the global supply chain and highlighted the lack of collaborative ability of supply chains in various countries. Therefore, it is of great significance to build a flexible export supply chain for improving the international competitiveness of China's high-tech products.High-tech enterprises and industry organizations should strengthen the internal restructuring and integration of the industry, improve the pertinence of supply, establish a price fluctuation warning mechanism, and prompt enterprises to timely export methods and marketing strategies. On this basis, it is necessary to pay more attention to the changes in laws, policies and standards related to new trade barriers of exporters, and make plans in advance to deal with trade frictions to reduce the probability of trade frictions.

4.4 Establish a system of positive circular penetration of high-tech products and service exports.

Driven by digital technology, the export competitiveness of China's high-tech services is increasing day by day. Information technology outsourcing and international software development and other services occupy an important share in the international market. Therefore, Our country is promoting the advantage of high-tech service export, strengthening the docking of the two, and building a circular promotion system of the two. China's high-tech enterprises take the initiative to connect with the relevant technical standards of high-tech products and services of developed countries, improve the level of intellectual property protection, and enhance the level of high-tech innovation in China by connecting with technical standards.On the basis of this, on the one hand, in information technology, electronic technology based on product and service advantages, enhance the technical content of products and services, on the other hand to continue to drive the development of high-tech products export structure diversification by exporting services, with the aid of digital "area" strategy and the advantage of new infrastructure investment, increasing exports to countries along the new energy, new materials and other products and services.

5 CONCLUSION

From the historical reference, China's rapid rise in the process of trade friction is inevitable, is the only way to rise as a great power. It is found that the various trade suppression measures implemented by the United States on China will have a negative impact on China's high-tech industry in the short term, but in the long run, the trade friction between China and the United States will also force China's high-tech industry to grasp the advantages, accelerate scientific and technological innovation, reduce the dependence on foreign advanced technology, and constantly optimize the industrial structure.

In the future, the United States will continue to increase its technological blockade of China and reduce its technological spillover to China. The US is trying to "decouple" China's science and technology globally, disrupt the layout of the global industrial chain and obstruct China's technological progress. China will face even more severe technological oppression. Under such severe circumstances, China can take active and effective measures to mitigate the impact of China's trade disputes by protecting the interests of domestic high-tech product trade enterprises, and based on the shortcomings of domestic high-tech product trade and production, improve the value of China's high-tech products in the industry by improving its own innovation ability. At the same time, we realize that the competitive pressure caused by the trade war between China and the United States can be transformed into a driving force for development, and further promote the technological innovation of high-tech products and export trade, so as to promote China's comprehensive national strength and international status. At the same time, China needs to strengthen the communication and consultation between countries, strengthen the understanding of intellectual property rights, actively open to the outside world, explore the emerging export market, make full use of the factor resources of the international market, at the same time, constantly increase the national financial expenditure related to the research and development of high-tech industry, strengthen the support of industrial policies, improve the industry development system, It will also cultivate and reserve technical talents for the development of the industry, absorb overseas outstanding talents, mobilize all favorable resources to create a good innovation environment, so as to increase the competitiveness of our high-tech products.

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