The Impact of External Events on the Industry: Taking the Pharmaceutical and Chip Industries as Examples

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Abstract. The Covid-19 pandemic and the Sino US trade war have been the focus of the international community in recent years. By using the methods of literature review and data analysis, this paper analyzes the short-term fluctuations and long-term development trends of medical devices, chemical pharmaceuticals, Chinese patent medicines and biopharmaceuticals in China under the pandemic situation. It also studies the impact of the measures taken by China and the United States in the chip game, as well as the political significance of the relaxation of chip restrictions in the United States: it seems to be courting China, but in fact it is to suppress Chinese chips more forcefully. The research results of this paper can provide reference suggestions for the policy authorities: there is a large development space for Chinese patent medicine and biopharmaceutical, and information technology also has broad application prospects in the pharmaceutical industry. China should continue to strengthen the research and development of chips to cope with the new round of offensive of the United States.

Keywords: COVID-19, Sino US Trade War, Pharmaceutical industry, Chip industry.

1. Introduction

Since the outbreak of the Covid-19 pandemic in early 2020, it has spread rapidly around the world and had a far-reaching impact on various fields. As one of the industries that play an important role in the pandemic, the pharmaceutical industry is also facing enormous challenges and opportunities. Therefore, understanding the impact of the Covid-19 pandemic on the pharmaceutical industry is of great significance to improve the prevention and control and response strategies of the pharmaceutical industry. The impact of the Covid-19 pandemic on the pharmaceutical industry is mainly reflected in the demand for drugs, medical devices and medical services. With the spread of the pandemic, people's attention to the pandemic has increased, and the demand for prevention and control drugs has also increased. During the pandemic period, the demand for related drugs increased rapidly, especially virus detection kits, antiviral drugs and other specific drugs. The pandemic also puts forward higher requirements for medical devices, such as respirators, protective clothing, etc.

Since 2018, the Sino US trade war has become the focus of global attention. The trade dispute between the two sides about imposing tariffs on each other has been escalating, which has a far-reaching impact on the global economy. As one of the core components of modern information technology, chip is of great significance for the development of various industries. China and the United States are the world's largest chip consumption and production markets, and the trade war between the two countries is bound to have a direct impact on the chip industry. In recent years, the competition in the chip industry between China and the United States has become increasingly fierce. Technology research and development, market share and industrial chain layout have become the key areas of competition for both sides.

This study will analyze the short-term impact of the Covid-19 pandemic on China's pharmaceutical industry and analyze the future development of China's pharmaceutical industry under the influence of the Covid-19 pandemic, so as to provide a useful reference for the sustainable development of the pharmaceutical industry. This paper will also analyze the impact of the strategies adopted in the Sino US trade war, especially in the game of the chip industry, on the chip industry, and the political significance behind these strategies, so as to provide reference for further understanding the far-reaching impact of the trade war on the industry.

The rest of the article is organized as follows: the second part is literature review,the third part is to study the impact of the Covid-19 pandemic on China's pharmaceutical industry, as well as the outlook for the future development trend. The fourth part is to study the impact of the Sino US trade war on the chip industry and the strategic significance behind the remedial measures taken by the United States. The fifth part is the conclusion.

2. Literature Review

Relevant studies show that the impact of the Covid-19 pandemic on the pharmaceutical industry is mainly reflected in the following aspects: first, the production capacity of pharmaceutical enterprises is affected, such as chemical raw materials, Chinese patent medicines, biopharmaceuticals, etc. Second, the impact on medical devices. Medical devices have strong impact resistance. Some large group companies can take advantage of this opportunity to continue to explore development space. Third, information technology should be more widely used in the medical industry.

The impact of the Sino US trade war on the chip industry is a complex issue. Relevant studies show that the Sino US trade war has caused instability in the supply chain and production chain of the global chip industry, resulting in rising raw material prices and reducing product profits. At the same time, it has also promoted the R&D and application of some new technologies and products.

However, there are still some deficiencies in the current research, such as the lack of long-term data. Future research can broaden the scope of research, strengthen the depth of research, and provide more valuable references and suggestions for the long-term development of the pharmaceutical industry and chip industry.

3. The Impact of the Covid-19 pandemic on the Pharmaceutical Industry

3.1. Short Term Trends in the Pharmaceutical Industry after the Outbreak of the Covid-19 Pandemic

From the perspective of product use, according to Table 1, the short-term growth of the pharmaceutical industry is at a low ebb, and the output of the chemical API manufacturing industry is reduced, and the growth rate is slowing down. Especially at the beginning of the outbreak of the Covid-19 pandemic, the output decreased sharply. However, with the gradual improvement of the pandemic prevention and control measures, the output slowly rebounded, but it will remain at a low ebb in the short term.

Table 1. 12.2019-12.2020 Chemical pharmaceutical production in China

Area: China				
Time	Output of technical chemicals (chemical bulk drugs)	Output of technical chemicals (chemical bulk drugs)	Output of technical chemicals (chemical bulk drugs)	Output of technical chemicals (chemical bulk drugs)
	Current value (10000 tons)	Cumulative value (10000 tons)	Year on year growth (10000 tons)	Cumulative growth (10000 tons)
12.2020	27.8	273.4	7.8	2.7
11.2020	24.7	235.8	6.9	2.3
10.2020	22.4	211.1	-3	-3.2
9.2020	21.9	186.9	5.8	0.5
8.2020	19.3	164.5	-1	-2.5
7.2020	21	147	1	-1.6
6.2020	25.8	129.3	0.8	-8
5.2020	23.2	103.6	0.9	-4.2
4.2020	25.3	85.7	1.2	-4.1
3.2020	24.8	67.2	-2.4	4.5
2.2020		37.9		-22.2
1.2020				
12.2019	24.7	262.1	10.8	3.1
Source: Support System for China Statistics Application				

At the beginning of the pandemic, western medicine specific drugs for Covid-19 pneumonia have not been found, and the development of new drugs takes a long time. Many experts start with traditional Chinese medicine to find a method to treat Covid-19. Covid-19 belongs to the category of "pandemic disease" in traditional Chinese medicine, and its main clinical manifestations are fever, fatigue, dry cough. The disease is located in the lung and is related to the spleen, stomach and heart [1]. The etiology is "pestilence" and has strong infectivity and susceptibility. Academician Wang Qi and others [2] believed that the TCM disease name of Covid-19 pneumonia could be named "lung blast".

Academician Zhang Boli believes that traditional Chinese medicine has obvious advantages in the treatment of patients with mild Covid-19 pneumonia, and traditional Chinese medicine can also play a good role in the treatment of patients with severe Covid-19 pneumonia. Mild patients are mainly characterized by fever, fatigue, and dry cough. Traditional Chinese medicine treats them with methods of dispersing lung and penetrating pathogens, aromatizing and clearing benefits, Purging Heat and detoxifying, etc., to prevent and treat disease pathogens in depth. If the blood oxygen saturation of critically ill patients decreases, Shenfu injection and Shengmai injection can be used to improve the blood oxygen saturation and improve the patient's condition. During the recovery period, traditional Chinese medicine can restore the physical ability of patients by removing the remaining pathogens and supporting the healthy qi, so as to promote the complete recovery of patients [3].

Many experts found that some prescriptions showed good effects in clinical practice. For example, Wang Raoqiong et al. [4] found that Qingfei Paidu decoction has obvious curative effect on cough, nasal congestion, runny nose, fatigue, anorexia, sore throat, diarrhea and other symptoms through clinical observation of light and ordinary patients before and after taking “Qingfei Paidu” decoction. Laboratory examination and chest imaging were also significantly improved, and no case was converted to severe or critical. Ding Xiaojuan and her colleagues [5] found that the treatment group was better than the control group in alleviating clinical symptoms, improving ventilation and improving lung conditions by comparing the conventional treatment with "Qingfei Touxie Fuzheng Decoction" combined with conventional treatment alone.

On March 5th, 2020, the State Administration of traditional Chinese medicine of China reported that the Institute of traditional Chinese medicine had successfully constructed the evaluation and verification work of 16 kinds of disease syndrome combined with animal model drugs suitable for

the efficacy evaluation of traditional Chinese medicine in the treatment of Covid-19 pneumonia. The results showed that Qingfei Paidu decoction, Huashi Baidu formula, Xuanfei Baidu granules, Jinhua Qinggan granules, Lianhua qingai capsule, Xuebijing injection and three Chinese patent medicines had obvious curative effect on Covid-19 pneumonia. Therefore, traditional Chinese medicine and Chinese patent medicine have received more attention from all walks of life. According to Table 2 the government budget has increased from 186million yuan in 2019 to 394million yuan in 2020.

Table 2. 2019-2020 Budget and final accounts of Chinese patent medicine industry

Time	2019	2020
Budget and final accounts of traditional Chinese medicine (100 million yuan)	1.86	3.94
Annual growth rate		111.83%
Source: Ministry of finance of the people's Republic of China, State Administration of Taxation of the people's Republic of China		

With the implementation of various national policies and the growth of per capita disposable income, consumption upgrading, chronic diseases and other factors, the market scale of traditional Chinese medicine still has a large growth space. According to Euromonitor International Statistics, as Figure 1 shows, from 2016 to 2020, the domestic market scale of Chinese patent medicine increased steadily, from 672.7 billion yuan to 898.5 billion yuan. It is estimated that the domestic market scale of Chinese patent medicine will reach 941.7 billion yuan in 2021.

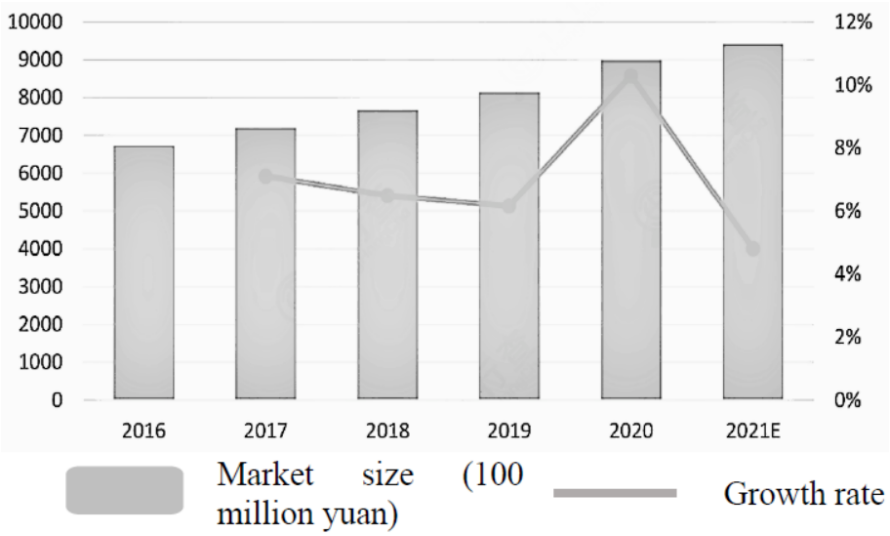


Figure 1. Market scale of Chinese patent medicine in 2016-2020

Source: Euromonitor

Photo credit: Original

Biopharmaceuticals also play an important role in the treatment of new coronal pneumonia due to their high pharmacological activity, small side effects and high nutritional value. In the later stage, the full genome sequence of new coronal virus was published, the virus nucleic acid detection kit was developed, the development of antiviral drugs and the listing of new coronal virus vaccine were irreplaceable. Therefore, the research and development of biopharmaceuticals in China has also been greatly increased. According to Table 3, biopharmaceutical expenditure increased by 38.68% from 2019 to 2020.

Table 3. Internal expenditure of R&D funds for high-tech industry (bio pharmaceutical manufacturing)

Time	2019	2020
Internal expenditure of R&D funds for high-tech industry (bio pharmaceutical manufacturing) (10000 yuan)	1226875.5	1701400.3
Annual growth rate		38.68%
Source: Ministry of science and technology of China, National Bureau of statistics of China		

According to statistics, in the list of net profits of Shanghai and Shenzhen A-share listed enterprises in the medical device industry in the first half of 2020, the net profits totaled 15.51 billion yuan, of which Mindray medical, Yingke medical, Lepu medical, Yuyue medical, Zhende medical, Ogilvy medical, lanfan medical, new industry, Nippon instruments and Wanfu biological were the top ten enterprises in the list of net profits of Shanghai and Shenzhen A-share listed enterprises in the medical device industry in the first half of 2020. According to statistics, the net profit of the top ten enterprises totaled 11.354-billion-yuan, accounting for 73.2% of the list. Mindray medical ranked first in net profit, reaching 3.454 billion yuan. Yingke medical ranked second with a net profit of 1.921 billion yuan. Lepu medical ranked third with a net profit of 1.14 billion yuan [6]. From the perspective of the medical device industry as a whole, since the outbreak, the turnover of enterprises in the field of in vitro diagnosis and medical protection has increased the most, and the team has expanded the fastest; As of October 2020, there were 92 listed medical device enterprises in China, 34 of which were in vitro diagnosis enterprises, accounting for 36. 7% 96% [7].

Table 4. Quarterly financial indicators of Lepu medical, 2019

Time / Financial Index	The fourth quarter of 2019	Third quarter of 2019	Second quarter of 2019	First quarter of 2019
Gross profit margin of single quarter sales (%)	71.00	71.00	73.00	74.00
Net profit margin of single quarter sales (%)	6.00	23.00	28.00	31.00
ROE of single quarter return on net assets (%)	2.00	6.00	8.00	9.00
ROA of total assets net interest rate in a single quarter (%)	1.00	3.00	4.00	4.00
Total operating revenue of a single quarter (yuan)	1915850960.00	1958655152.00	2042888427.00	1878134847.00
Total operating cost in a single quarter (yuan)	1606045038.00	1479199706.00	1420305056.00	1371080991.00
Single quarter operating income (yuan)	1915850960.00	1958655152.00	2042888427.00	1878134847.00
Single quarter operating profit (yuan)	127764223.00	504589919.00	643660910.00	685236654.00
Total quarterly profit (yuan)	158060422.00	522072912.00	691092769.00	692029451.00
Single quarter net profit (yuan)	107450910.00	457258537.00	580560032.00	578522242.00
Source: https://stock.qianzhan.com/				

Taking Lepu medical as an example, according to Table 4 and Table 5, compared with the operation status in 2019, although there was a slight decline in the first quarter of 2020, it soon recovered to a high level in the second and third quarters, and far exceeded the operation results of the previous year. However, the decline in the fourth quarter of 2020, which I believe is a normal phenomenon, may be due to the centralized procurement of coronary stents organized by the state at that time, as well as the impact of the pandemic on the number of implantable devices and hospital outpatient and surgical volume, which led to the short-term fluctuations in Lepu medical performance.

Table 5. Quarterly financial indicators of Lepu medical, 2020

Financial Index \ Time	The fourth quarter of 2020	Third quarter of 2020	Second quarter of 2020	First quarter of 2020
Gross profit margin of single quarter sales (%)	56.00	68.00	69.00	74.00
Net profit margin of single quarter sales (%)	-8.00	38.00	31.00	23.00
ROE of single quarter return on net assets (%)	-2.00	9.00	9.00	5.00
ROA of total assets net interest rate in a single quarter (%)	-1.00	5.00	5.00	2.00
Total operating revenue of a single quarter (yuan)	1651562230.00	2149266100.00	2571233607.00	1666605604.00
Total operating cost in a single quarter (yuan)	1696446052.00	1720154167.00	1581617613.00	1194292376.00
Single quarter operating income (yuan)	1651562230.00	2149266100.00	2571233607.00	1666605604.00
Single quarter operating profit (yuan)	-179142395.00	952910807.00	918507671.00	456901602.00
Total quarterly profit (yuan)	-145250073.00	956533042.00	928818090.00	463212131.00
Single quarter net profit (yuan)	-133402331.00	826498167.00	794660817.00	389321915.00
Source: https://stock.qianzhan.com/				

Meanwhile, the impact on companies of different sizes is different. Listed companies like those mentioned above have large development space, but some small and medium-sized enterprises will face uncertain risks such as business stagnation, limited cooperation or acquisition by leading enterprises.

3.2. Cause Analysis and Long-term Outlook

(1) For the pharmaceutical industry, in the first quarter of 2020, China's pharmaceutical industry received the impact of the outbreak of the Covid-19 pandemic, and pharmaceutical enterprises delayed the start-up to varying degrees. Shutdown, transportation obstruction, logistics control and personnel traffic restrictions have had a significant impact on the operation of pharmaceutical enterprises. However, as one of the regions with the fastest growth of drug consumption in the world, China has a huge demand for medicine, and the market size of the pharmaceutical industry is expected to grow steadily in the future. In 2020, the market size of the global pharmaceutical industry will approach us $1.40 trillion. According to IMS' prediction, the global drug consumption will still maintain a growth rate of 3% in 2021, which is higher than the speed of population changes and population structure transformation, and the market scale of the global pharmaceutical industry is expected to maintain a growth rate of 4% -5% in the next few years [8]. From the perspective of market distribution, according to the data of the European Federation of pharmaceutical industry associations (EFPIA), the sales of pharmaceutical products in China's market have reached 20% of the world's total. Affected by population growth, economic development and the gradual popularity of various new drugs in developing countries, the development of emerging medical markets is significantly faster than that of developed countries.

(2) During the pandemic period, integrated traditional Chinese and Western medicine participated in the treatment of patients, and traditional Chinese medicine was more widely used, which was beneficial to the traditional Chinese medicine industry and enterprises, and drove the demand growth of Chinese patent medicine manufacturing industry. For many East and Southeast Asian countries, such as Japan and South Korea, they are deeply influenced by Chinese culture and have formed systems of Chinese medicine and Korean medicine. The Covid-19 pandemic is also an opportunity to promote exchanges of botanical medicine among countries. At the same time, the outbreak of the

Covid-19 pandemic has driven the demand for vaccines, blood products, etc., and the biopharmaceutical industry also has huge growth space.

(3) As one of the world's largest producers of medical devices and protective equipment, during the pandemic period, the supply of medical supplies recovered rapidly, and the production capacity of medical supplies such as masks, protective clothing and thermometers increased significantly. According to the news and newspaper summary of the voice of China, the State Council's joint prevention and control mechanism press conference introduced the production and security of medical materials on April 8th, 2020. Caoxuejun, deputy director of the consumer goods industry department of the Ministry of industry and information technology, said that the production capacity and output of medical materials increased significantly by fully mobilizing the resumption of work and production, supporting the technological transformation and expansion of enterprises, opening up green channels, and speeding up the approval of production enterprises' qualifications [9]. At the same time, China's medium - and low-end medical products have high international recognition and can be exported to many European and American countries that can't meet their own needs due to labor costs and other factors, driving the growth of the medical device industry.

(4) Group pharmaceutical enterprises can take advantage of their own scale advantages to match the newly added drug import ports by the government, extend the front-end of the import manufacturers vertically, and expand the back-end horizontally by using their own sales network at coastal and inland ports, so as to promote the upgrading of the industrial chain and supply chain. In particular, medical equipment enterprises and medical service institutions should timely adjust their production and supply chains to meet market demand. The government should also increase support for the development of the medical device industry to ensure the supply and quality of medical devices, continuously improve the level of medical services, and improve the R&D and innovation capabilities of medical devices, in order to better respond to the challenges of similar outbreaks that may occur in the future.

(5) The pharmaceutical industry can increase the application of digitalization and information technology. For example, through the establishment of electronic health records and data sharing platform, medical institutions can more quickly obtain the basic information and medical history of patients and improve the accuracy and efficiency of diagnosis. Telemedicine technology, such as remote consultation and remote monitoring, can help doctors and patients communicate and diagnose online, reduce the risk of face-to-face contact, and ensure the safety of medical staff and patients.

4. The Impact of Sino-US Trade War on Chip Industry

4.1. Background Overview

Sino US trade war, also known as Sino US trade disputes and Sino US trade frictions, is an important issue in Sino US economic relations. The Sino-U.S. trade war mainly occurred in two aspects: first, China's export fields with comparative advantages, especially steel and aluminum products, and second, China's import and technical knowledge fields without advantages. The former is basically competitive, while the latter is not fully functional. Their impact on the economic welfare and long-term development of the two countries is different. Trade disputes mainly focus on the first aspect.

The development of Sino US trade war can be traced back to the 301-investigation launched by the US government against China in 2017, accusing China of intellectual property infringement and compulsory technology transfer. Subsequently, the U.S. government successively imposed tariffs on all kinds of Chinese goods and continued to expand the scope of tariffs. The Chinese government has also taken counter measures against certain categories of goods in the United States. The two sides-imposed tariffs on each other and gradually increased tariff rates, leading to sharp tensions in Sino US trade relations.

In the process of development, China and the United States have conducted many negotiations to try to solve their trade disputes. However, these negotiations did not achieve the expected results, and

the two sides had differences on many core issues. The implementation of tariff policies between China and the United States has been constantly upgraded, which has had a serious impact on the enterprises and economies of the two countries. The outbreak of the trade war has triggered the instability of the global financial market and increased the risk of the global economy.

Today, the science and technology industry has become one of the pillar industries in the national economy of various countries, and Chinese and American chips are the top priority in the field of science and technology, which has a significant impact on the global chip industry. However, the Sino US trade war has caused many negative effects on the chip industry, mainly reflected in the increase in production costs, changes in market demand and the increase in the difficulty of technology research and development.

The Sino US trade war led to the rise of chip production costs. Affected by the tariff policy, the price of raw materials has risen, which has greatly increased the production cost of chips. This makes many chip companies face greater profit pressure, affecting the development of the industry.

The trade war has changed the demand of the chip market. Due to the uncertainty of the trade war, market confidence has been impacted, and investors' demand for the chip industry has declined. In addition, some industries that reduce investment or output due to tariff policies, such as automobile manufacturing and consumer electronics, also have a corresponding reduction in the demand for chips.

The trade war has affected the difficulty of chip technology research and development. Due to the prohibitions and restrictions of some advanced technologies, chip manufacturers are facing difficulties in technology research and development. This not only reduces its ability of independent innovation, but also affects the competitiveness and long-term development of the industry.

These impacts directly led to the plight of the chip industry. In the future, the chip industry may still face greater uncertainty and challenges, but with the recovery of the global economy and the easing of trade tensions, the chip industry has a broad development prospect.

4.2. The Impact of China's Restrictions on Rare Metal Exports

On July 3, 2023, the Ministry of Commerce and the General Administration of Customs of China announced the implementation of export controls on important rare metals gallium and germanium, which took effect on August 1. As extremely important scarce strategic resources, gallium and germanium are widely used in satellite communications, solar cells, semiconductors, artificial intelligence and other scientific and technological frontier fields. Gallium arsenide is the representative of the second-generation semiconductor material, gallium nitride is the most advanced semiconductor material in the world as a typical third generation semiconductor material, and this element is now used in the rapid development of electric vehicles and 5G technology.

According to the data of the United States Geological Survey (USGS), the world's proven reserves of germanium resources reach 8600 tons, and the United States ranks first with 3870 tons, accounting for 45% of the world's reserves; China's germanium reserves are 3500 tons, accounting for 41% of the world's, ranking second. However, germanium in the United States is mainly associated with lead-zinc mines, and germanium production is subject to Lead-Zinc production. Among the 35 mining areas in China where germanium reserves have been identified, about half of the identified germanium reserves are associated with coal mines, and most of the rest are associated with non-ferrous metal minerals such as lead-zinc mines, with great development potential. According to the statistical table of national mineral resources reserves in 2022, as of 2022, China's proven germanium reserves had reached 2333.47 tons, an increase of 7.89% over the previous year [10].

Therefore, China's announcement on restricting the export of rare metals has been issued, which has caused an uproar in the world. Countries that have long relied on imports of rare metals, such as the United States, Japan, the Netherlands, and other western countries, have reacted particularly fiercely. Because of their long-term dependence on imports, their domestic rare metal production is not enough, and they lack relevant mining technology and industrial chain. ASML, the leading Dutch lithography company, directly expressed the hope that China would not restrict the export of rare metals. Although the United States has a good stock of rare earth resources, it will take at least several

years to develop the relevant industrial chain, which is obviously not in line with the United States' ambition to dominate the global chip industry for a long time.

China's restrictions on the export of rare metals will inevitably lead to a rise in the price of rare metals worldwide, and there will be a shortage of supply. The United States is the world's largest chip exporter and has a great demand for rare metals. The rise in the price of rare metals will not only affect the production cost of the chip industry, but also trigger its demand for rare metal substitutes. However, due to the particularity and importance of rare metals, as well as the limitations of technology and cost, it is difficult to find suitable alternatives. Therefore, it can be predicted that if the United States cannot find appropriate solutions, its domestic chip industry will suffer a serious blow.

4.3. The Impact of Restrictive Measures Taken by the United States Against China

(1) In order to curb the rise of China's chip industry, the United States has taken a series of targeted measures. These include sanctions on China's scientific and technological undertakings, prohibition of the provision of chips and other key technologies to Chinese enterprises, and restrictions on the development of Chinese enterprises such as Huawei in the U.S. market, especially in the 5G field. The United States has also strengthened the review of Chinese science and technology enterprises and restricted the transactions designed for the national security of the United States. These measures are the product of the United States' fear that Chinese chips threaten the United States' leading position in the global science and technology industry.

(2) The United States imposes export restrictions on high-end chips, suppresses the development of Chinese science and technology enterprises, and imposes sanctions on Chinese chip enterprises, which has created technical barriers to a certain extent, making it more difficult for China US chip cooperation, and many chip companies have lost China's huge chip market. Many chip enterprises have set up production lines and factories in China, imposing sanctions on the Chinese chip industry, and will also hit the global supply chain, Affect business operations. As the world's second largest economy, China has a broad market size, and the same is true in the chip industry. No ambitious enterprise wants to give up the Chinese market.

(3) The United States itself will also face enormous pressure to restrict Chinese chips. According to the data of the American Semiconductor Association (SIA), the United States won 48% of the global chip market in 2022, ranking first in the world. About 40% of these chips were sold to China. Thus, it can be seen how much American chip enterprises rely on the Chinese market and restrict the export of chips to China, and American chip enterprises will directly lose 40% of their profits. In 2023, China's import of chips decreased significantly. According to the data of the General Administration of Customs of China, the number of chips imported by China from January to July 2023 was 270.17 billion, a decrease of 16.8%, and the import amount was 1.32 trillion yuan, a decrease of 16.2%. This will undoubtedly cause huge loss of profits for American chip companies. Taking Qualcomm as an example, the third quarter financial report data as of June 25, 2023, showed that Qualcomm's adjusted total revenue was $8.44 billion, down 23% year-on-year, lower than the expected $8.5 billion; The adjusted earnings per share was $1.87, higher than the expected $1.81 per share; Net profit fell to US $1.8 billion, down 52% from US $3.73 billion in the same period last year. Recently, Qualcomm announced that it would lay off 1258 employees in California. The announcement of this plan coincides with the release of Huawei mate60, and Huawei announced that from 2024, all products will fully use Kirin processors developed by itself and will not purchase products from third-party suppliers such as Qualcomm. This fact shows the adverse effects of the US sanctions against China on itself.

(4) For domestic technology enterprises in China, the sanctions imposed by the United States on Chinese technology enterprises have also stimulated the increase of domestic R&D efforts in China, especially in the fields of 5g technology, artificial intelligence, the Internet of things and cloud computing, which have independently developed chip products, bringing new development momentum to the Chinese chip market. In addition, the Chinese government's support for the chip

industry has provided a good policy environment and market protection for these chip enterprises, and Chinese chip enterprises have ushered in the opportunity to establish a sound industrial chain and ecosystem.

4.4. Remedies Available to the United States

4.4.1. Extraction of Gallium from Industrial Waste

One of the solutions for the United States to deal with the supply interruption of rare metals in China is to extract gallium from waste products. However, this method is not feasible because it is difficult to extract gallium from waste products. First of all, the gallium content in waste products is quite low, and the extraction technology is complex and costly, which is time-consuming, laborious and costly. Secondly, other toxic substances may be produced during the extraction process, causing harm to the environment, which is contrary to the original intention of the United States to choose to import rare metals instead of mining from its own country, so as to avoid environmental pollution. In addition, the recycling and disposal of waste products will also consume a lot of human resources.

4.4.2. Liberalize Restrictions on China

According to Reuters, on July 17, 2023, senior executives of American chip giants Intel, Qualcomm and NVIDIA gathered in Washington to meet with Secretary of state Lincoln and other senior officials of Biden administration to discuss the semiconductor export restriction policy to China. On the same day, the semiconductor industry association, the most influential semiconductor lobby group in the United States, urged the government to stop taking more restrictions on chip exports to China [11]. Obviously, the three American chip giants do not want to lose the Chinese market but are suppressed by their peers.

China's measures to restrict the export of rare metals this time are a counterattack to the long-standing US policy of suppression and sanctions against China. Therefore, liberalizing restrictions on Chinese science and technology enterprises, courting China and seeking friendly cooperation with China are undoubtedly effective ways to solve the demand for rare metals in the United States.

In September 2023, the U.S. Department of Commerce announced that it would allow U.S. chip companies to continue exporting chips to China, but the political significance behind this move is very complex. First of all, there are very radical Anti-China factions in the United States who hope to continue to take tough measures to restrict China's development. However, the firm position of the Chinese government and the positive response of Chinese technology enterprises have made the chip war between the two countries more anxious and forced the U.S. government to reconsider its strategy towards China. Second, domestic technology companies in the United States also need to earn profits in the Chinese market. Therefore, the US government's choice to relax the chip ban is the best choice under the current political background. On the one hand, it can ease the tension between the two countries and create conditions for the follow-up cooperation between the two countries, especially in rare earth resources. On the other hand, it can also meet the needs of domestic capitalists in the United States and stabilize their emotions.

However, this does not mean that the United States and China will develop peacefully in the field of chips. First of all, relaxing the ban on chips does not mean complete liberalization. For the most high-end chip products, it will certainly still restrict the export to China, which will also stimulate domestic chip companies in the United States to increase research and development efforts and maintain technological advantages. Secondly, the United States may adopt the dumping strategy to sell chips at a large price in China, seize the Chinese market, suppress the development momentum of Chinese chip enterprises, and cause a serious blow to China's domestic chip industry chain.

5. Conclusion

By analyzing the short-term impact of the Covid-19 pandemic on China's pharmaceutical industry and the impact of the Sino US trade war on the chip industries of the two countries, this paper forecasts

the future development trend of China's pharmaceutical industry and explores the significance behind the strategies adopted by the two countries in the Sino US chip game.

For China's pharmaceutical industry, medical devices, especially high-tech products, have broad development space after the impact of the new coronal disease, and will be paid more attention by the state. Chinese patent medicine and biopharmaceuticals have played an important role in the treatment of new coronal pneumonia and will usher in a new development opportunity. Group pharmaceutical enterprises can also take advantage of this opportunity to re integrate the supply chain and production chain. At the same time, information technology will be more widely used in medical services to improve the efficiency of medical services.

The chip war between China and the United States has entered a white-hot stage. The United States wants to maintain its scientific and technological hegemony in the world, but the development momentum of China's science and technology seems irresistible. Although the United States has taken many measures to restrict the development of Chinese science and technology enterprises, and China has also responded by restricting the export of rare metals, this is not only not conducive to the cooperation between the two countries in science and technology, but also has an impact on global science and technology enterprises. The chip giants in the United States are also dissatisfied with the strategy of restricting China. Therefore, the US government announced to relax the restrictions on Chinese chips, which is conducive to easing the tension between the two countries, but this may be the beginning of the US government's next strategy. Through the dumping strategy, seize the Chinese market and squeeze the development space of China's domestic science and technology enterprises. Chinese domestic enterprises should make use of the support of the government, strengthen research and development, strengthen independent innovation, improve product competitiveness, and achieve greater development in the global chip industry competition.

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