The impact of COVID-19 on China's position in global value chains and countermeasures

Wenyue Dai[1 *]

[1]J-BJI, Jinan University, Guangzhou, China

*Corresponding author: daisy@stu2018.jnu.edu.cn

Abstract. Since the outbreak of COVID-19 in 2019, economies around the world have been affected and disrupted. Global value chains, which should be based on mutual trust and international division of labor, have been shaken by trade frictions and the impact of the epidemic. In the aftermath of the outbreak, many countries began to restrict exports involving vital resources and commodities related to their economies and livelihoods to protect their economies, especially in developed countries. These practices will lead to a restructuring of global value chains centered on Chinese manufacturing, which in turn will affect China's position in global value chains. This paper hopes to scientifically argue the epidemic's impact on global value chains with the help of global data. By quantifying the data, we visualize the changes in global value chains and the impact on China with graphs. And some feasible suggestions are proposed for this phenomenon.

Keywords: GVCs; COVID-19; China; challenge.

1. Introduction

The global value chain (GVC) is a global cross-enterprise network or collaborative organization that connects the production, distribution, and recycling processes to realize the value of goods or services. It involves the procurement and transportation of raw materials, the production and distribution of semi-finished and finished products, and the final consumption and recycling processes, including all participants in the organization and the production and sales activities and their value and profit distribution.

1.1 The Selected Topic Background and Significance

In 2019, COVID-19 is spreading around the world. We do not know when the epidemic will end, but it has changed every aspect of our lives. Global value chains have entered the 3.0 era, with new features of regionalization, micromanagement, and diversification value chains, accompanied by complexity and uncertainty. Global value chains are indeed facing the problem of how to develop next. There are many factors affecting the development of global value chains. The reform of the World Trade Organization system is progressing slowly, and four regional free trade systems, led by the EU, the Regional Comprehensive Economic Partnership Agreement (RCEP), the Comprehensive and Progressive Trans-Pacific Partnership (CPTPP), and the U.S.-Mexico-Canada Agreement (USMCA), are taking shape globally. Each free trade system has different criteria and is somewhat exclusive to economies outside the region. Trade and investment within the regional free trade systems are more efficient, stable, and less risky than those within the WTO framework. As a result, intra-regional value chain trade and investment will continue to grow.

As supply chain concentration in North America increases and supply chain competition in Southeast Asia intensifies, supply chains in these two regions will be reformed. The resulting risk is that it remains uncertain whether the reforms will make good use of the original capabilities and resources. After all, each region has different needs. When new demand emerges, there may be excess capacity available. In some countries, industrial upgrading and new demand for green and low-carbon industries also pose risks and create new uncertainties. In addition, trade protectionism persists, and many supply chains, represented by semiconductors, remain in a precarious state. Some countries' foreign trade and investment policies trying to force changes in the distribution of global value chains cannot be ignored. With the divergence of World Trade Organization (WTO) reforms, geopolitical conflicts have intensified and strategic games between major powers have intensified. The next step in globalization will no longer be driven by the multilateral system, the global operating system of major powers and multinational corporations, but by the micro, private, and periphery.

1.2 Related Literature Review

Closely related to this paper is the literature on the analysis of the economic impact of COVID-19. There have been many studies on the economic impact of the 2019 coronavirus disease, but scientific assessment tools have not been developed to quantify the impact of COVID-19 on global value chains. Existing studies have focused on the macro, questionnaire, and micro levels. Most studies have focused on qualitative analysis. Only a few studies have used models to quantitatively assess the outbreak. The g-cubic model to examine the economic impact of novel coronaviruses shows that under different policy scenarios, health prevention systems are more lacking in less developed economies, resulting in higher investment costs for epidemic prevention.[1] A global computable general equilibrium model (Envisage model) was used to assess the impact of COVID-19 on the global economy. Two policy scenarios, 'global epidemic' and 'enhanced global epidemic', were developed and four transmission mechanisms or four policy impacts were constructed for simulation. The results show that the epidemic would severely impact the global economy, particularly in sectors such as services and tourism.[2] The epidemic could directly lead to a shortage of supply of export capacity in China, or some domestic industrial chains could shift out, but the extent of the industrial shift would be limited.[3] The impact of pneumonia on the global value chain is analyzed using the example of personal face protection materials in the USA.[4] The study suggests that the main reason for the shortage of N95 masks in the US is a policy failure, not a market failure and that the presence of a global value chain allows for a better rebound of policy effects.

However, existing studies have effectively assessed the impact of NCCP on China's participation in GVCs. Linking production decomposition models to assess the impact of Coronavirus Disease 2019 on China's participation in global value chains and to inform China's proactive response to Coronavirus Disease 2019 from a global value chain perspective.[5] Gali's New Keynesian model is applied to study global economic change. The model assumes that aggregate demand determines output and employment and then quantifies the impact of a new coronavirus epidemic on aggregate demand.[6] Big data was used to analyze the movement of people returning home during the Spring Festival and a significant correlation was found between the number of people on the move and the number of cases.[7] The global economy is set to experience a sharp decline, followed by a V-shaped recovery.[8] The epidemic has had a significant impact on both global supply and demand, with varying degrees of impact on international trade in goods and services. The report also notes that the six regions most affected by the Newcastle pneumonia outbreak are the core centers of global value chains, and that supply-side shocks will directly affect trade in intermediate goods in global production networks, i.e. 'global supply chain contagion'.[9] Given the impact of global value chains, some countries will be affected even if they are not directly affected by the outbreak.[10] This mechanism channel has been tested and identified by many scholars as early as 10 years ago during the "Great Trade Depression".

2. The Evolution of GVCs and China’s position in GVCs

In this paper, we visualize the impact of the epidemic on global value chains and China, including the challenges posed to China, through scientific data processing. We hope to make some constructive suggestions to help China tide over the new situation of GVCs restructuring. This paper focuses on researching and quantifying economic data related to GVCs, collecting data from authoritative platforms such as the World Bank, OECD, UN Comtrade, and National Bureau of Statistics, and presenting them in pictures. We reclassify the industry categories to focus on manufacturing and some leading Chinese products. The impact of the epidemic on China's position in the global value chain is derived based on changes in import and export trade.

This paper is divided into five paragraphs. First, the background and significance of the chosen topic and summarize the related papers. This is followed by a study of the evolution of global value chains before the epidemic and China's position in global value chains. Then, the impact of the epidemic on GVCs and the challenges China faces in restructuring GVCs are studied. Finally, it then lists China's should-to approach and concludes.

2.1 The evolution of GVCs and each stage's characteristics

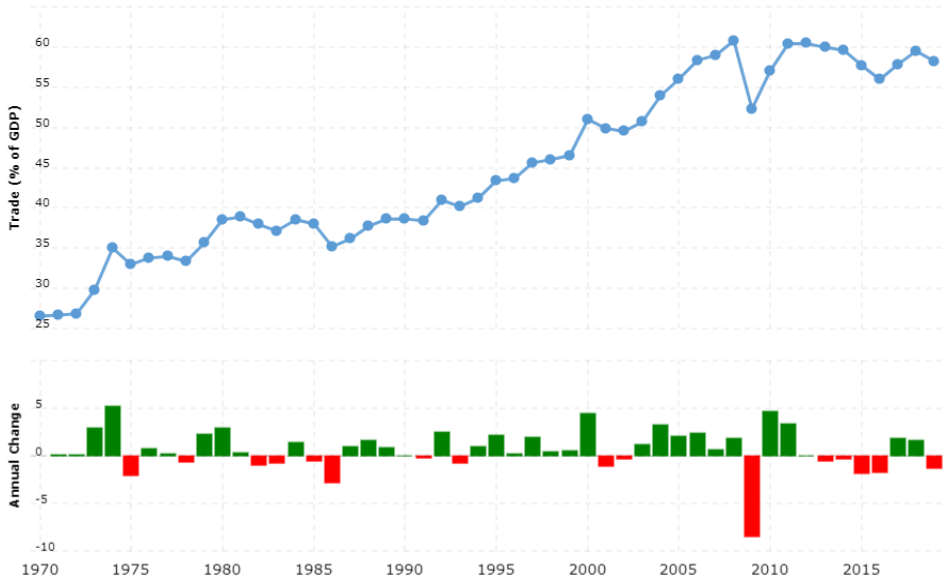


Fig. 1 World trade overworld GDP (1970-2019)
Source: World bank's world development indicators.

World trade as a percentage of world GDP is the simplest measure of globalization that I can go back to (Fig. 1). I see a spectacular increase in the proportion of trade to GDP (%) occurred in the mid to late 80s, during the global financial crisis. As you know, there was a severe trade collapse in 2009, but a very pronounced and rapid recovery followed. Since then, the share has declined slightly but remained stable. In other words, there was growth, then stagnation. Thus, it is not obvious from this series that there is globalization. If there is any difference, it is that the growth of globalization seems to have slowed down. We should not expect world trade growth as a percentage of world GDP in the 1980s, 1990s and the first decade of the 21st century to be curbed over time. In the meantime, things must become more stable and constantly changing.

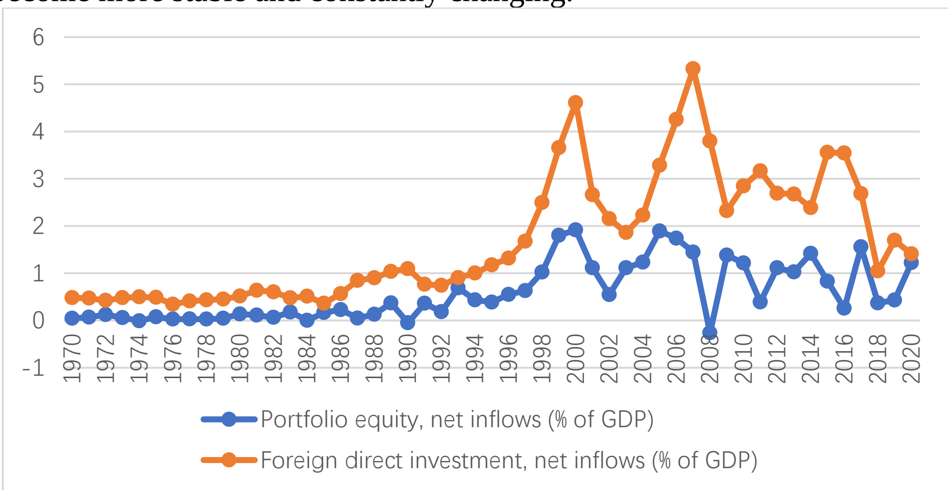


Fig. 2 FDI inflows and portfolio equity inflows as a share of GDP (1970-2020)
Source: World Bank WDI database.

The point I want to emphasize is that the world is de-globalizing, and I'm concerned about capital flows. If you look at the various indicators of capital flows, such as foreign direct investment flows, portfolio flows, and so on, they started at the onset of the financial crisis and have been declining since then. (Fig. 2) They've fallen, but they haven't recovered quickly. But in any case, I think the levels have fallen and two ratios are now lower than they were in the late 1990s. If there is a contraction in capital flows, it won't take us back to the 1940s or 1950s. More importantly, this situation may have just gotten out of hand before the financial crisis, but we are back to normal.

The 1990s saw the rapid development of global value chains (GVCs), with almost all global economies participating in GVC networks. At the beginning of this century, GVCs formed an Asia-Pacific segment centered on the United States and a European segment centered on Germany. As China became the world's largest trader of goods, by 2018, the GVC network gradually evolved into a three-pillar segment with North America, Europe, and Asia at its core. At the core of each group are the United States, the European Union, and China.[11]

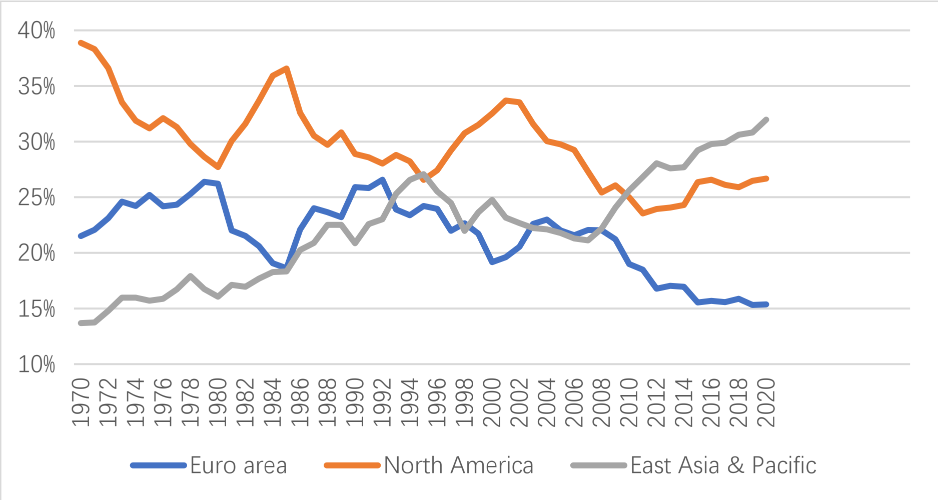


Fig. 3 GDP of three regions' overworld GDP (1970-2020)
Source: OECD database.

Fig. 3 shows the changes in GDP shares of the three regions (Eurozone, North America, East Asia, and the Pacific) from 1970 to 2020. It is found that from 1970 to 2000, East Asia and the Pacific had the relatively lowest market share and the composition of the global economy was dominated by North America and Europe. However, after 2000, especially after the financial crisis in 2008, East Asia showed a rapid increase in its share of regional GDP. after 2010, China overtook North America and Europe to become the world's largest market. A pattern has been formed in the three major markets of Asia, the United States, and Europe.

In summary, the evolution of global value chains can be divided into three stages.

In the first stage, from the end of World War II to the early 1990s, MNCs realized the global distribution of their internal value chains by setting up branches across the country. During this period, global value chains achieved unprecedented development. After the end of the Cold War, the World Trade Organization was established as a global trading system, which meant the lowering of trade barriers. The U.S.-led global financial system brought about unprecedented capital flows and profit-driven growth. Multinational corporations located their headquarters globally to minimize costs. In addition, global innovation and technology have driven advances in infrastructure and global value chains have been given good opportunities to grow. GVC trade, especially in machinery, electronics, and transportation, grew rapidly.

The second stage is market, innovation, and openness-driven GVCs, which are highly related to the international process division of labor. International process division of labor is directly related to three factors: economic globalization, information technology revolution, and Sino-US cooperation. International process division of labor means that a product can be produced in different parts of the world, allowing for zero inventory and just-in-time delivery. Each region has a different value-added position in the value chain for its production process and production chain. Some areas are responsible for R&D and technical services, some for the production of key components, and some for the processing and assembly of intermediate products. the IT revolution has brought about an integrated logistics revolution and global supply chain management. This has significantly reduced communication and transportation costs and ensured zero inventory of products worldwide. For example, if China produced lithography, China would not be able to produce chips and buy them from countries such as the US and Europe. This phase seems romantic, focusing only on efficiency and zero inventory, without considering the new crown pneumonia, US-China trade friction, and anti-globalization.

Now comes the third stage, with smarter tools, and the traditional IT revolution shifts to the AI revolution. The difference between the AI revolution and the IT revolution is that the AI revolution incorporates technologies such as cloud computing, big data, and the industrial Internet to understand personalized needs precisely and organize small batch production. This could be the era of the end of globalization, where value chains are given complex value. For example, China and the US used to be able to work together, but now they can't. The same product with American technology cannot have Chinese technology, and if it has Chinese added value, it cannot have American added value. At the same time, global value chains are facing restructuring amidst uncertainties due to factors such as the new crown pneumonia. China-centered global value chains remain under the shadow of New Crown pneumonia. In the wake of the pandemic, many countries are proposing to strengthen their capacity to produce essential medical supplies and are encouraging companies to pull back their production lines. This will lead to a reorganization of global value chains centered on Chinese manufacturing, which in turn will affect China's position in the global value chain.

2.2 China’s position in GVCs

Since 2013, China's total trade in goods has almost surpassed that of the United States to rank first in the world. According to incomplete statistics, China is now the largest exporter of 33 countries, the largest importer of 65 countries, and the largest trading partner of 120 countries. China plays an important role in global trade. According to the World Trade Organization, in 2019, China's total trade in goods was $4.58 trillion, $363.07 billion higher than that of the United States, accounting for about 11.5% of global trade in goods. This chapter focuses on the characteristics of the industrial distribution structure of China's imports and exports as well as the foreign trade structure of China's major importing and exporting countries and regions, with the study mainly focusing on trade in goods.

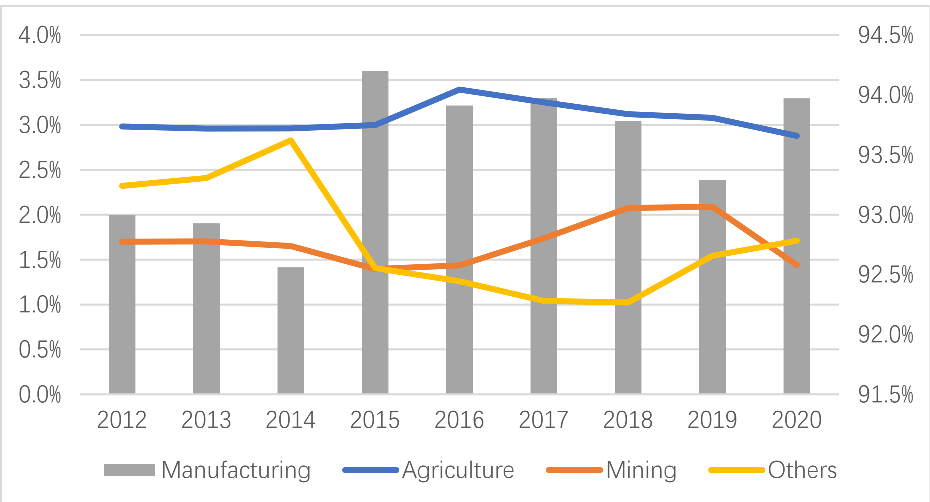


Fig. 4 Share of exports by industry (2012-2020).
Source: National Bureau of Statistics.

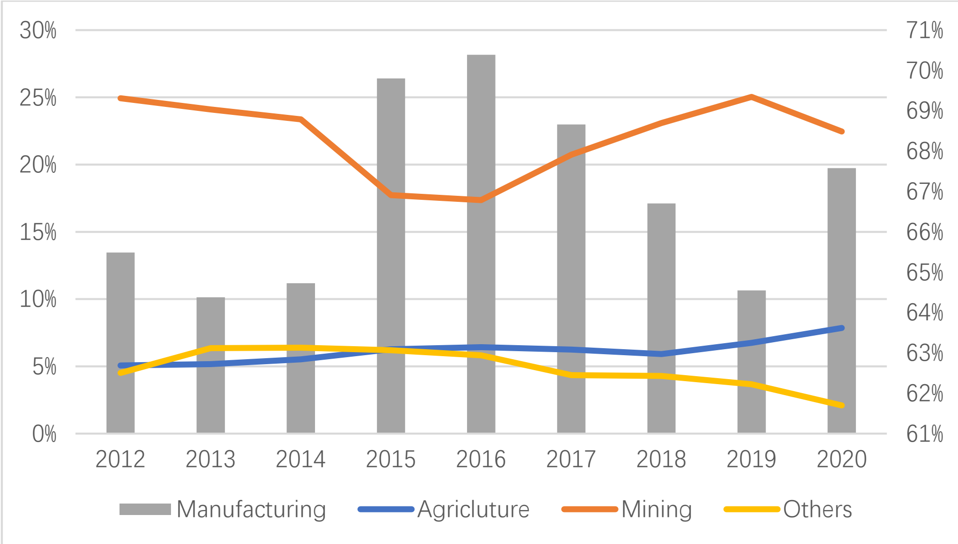


Fig. 5 Share of imports by industry (2012-2020).
Source: National Bureau of Statistics.

We are classified according to the industries and sub-sectors to which the HS code belongs. As shown in Fig. 4, in terms of industrial distribution, the manufacturing sector has an absolute advantage in China's foreign trade industry, accounting for more than 92% of manufacturing exports and more than 64% of imports. However, since the trade friction between China and the U.S., the share of China's manufacturing imports has dropped significantly.

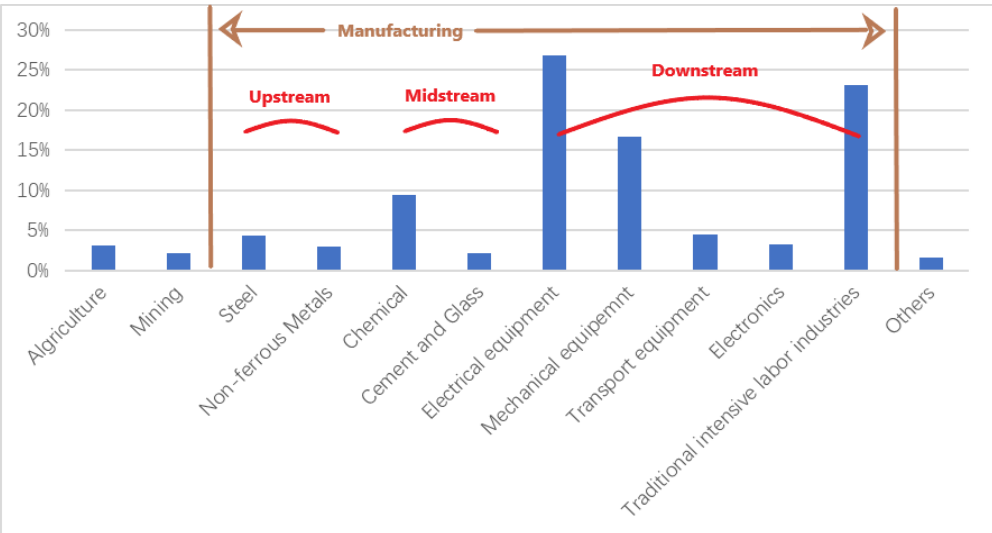


Fig. 6 Export industry distribution in 2019.
Source: National Bureau of Statistics.

Export segments are further analyzed. 2019 saw a high proportion of exports from chemical, electrical, machinery, and equipment, traditional labor-intensive industries, and dominance of mid- and downstream manufacturing. This indicates that Chinese companies are world leaders in terms of processing and mass production capabilities. We divide manufacturing into three categories: upstream, midstream, and downstream, and provide a brief analysis of industries at different positions in the chain. As shown in Fig. 6, chemical, electrical equipment, machinery and equipment, and traditional labor-intensive industries account for a high proportion of exports to the middle and lower reaches of manufacturing.

The structure of China's export industry shows that China has an advantage in processing and mass production in manufacturing. On the one hand, China is the only country in the world that has a complete industrial chain. In addition, the massive investment in infrastructure development in the last decade has made it very easy to transport goods and people, which has greatly reduced production and manufacturing costs and improved the efficiency of resource allocation. On the other hand, labor costs in China have risen. However, from a global perspective, the professionalism, dedication, and diligence of China's labor force are far better than those of most countries, and labor output is relatively high.

Traditional labor-intensive industries account for less than a quarter of exports, while electromechanical products (electrical equipment, machinery, electronics, transportation equipment) account for more than half. This indicates that China's export structure has changed from labor-intensive to technology-intensive, but the added value of electromechanical products still needs to be improved. In 2019, traditional labor-intensive industries accounted for 23.3% of exports, while electromechanical products (electrical equipment, machinery, and equipment, electronic products, and transportation equipment) accounted for 51.3% of exports. China's export structure has changed from labor-intensive to technology-intensive. However, at present, China's technology-intensive industries may still be in the middle and low end of the global industrial chain, and the added value needs to be improved. The analysis of the import structure shows that there are still many shortcomings in China's manufacturing industry.

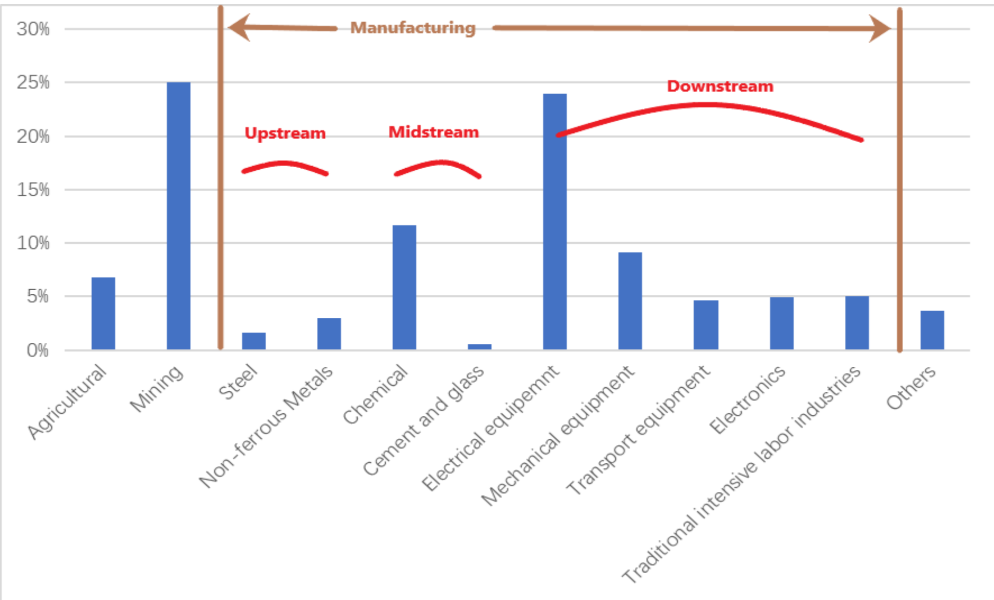


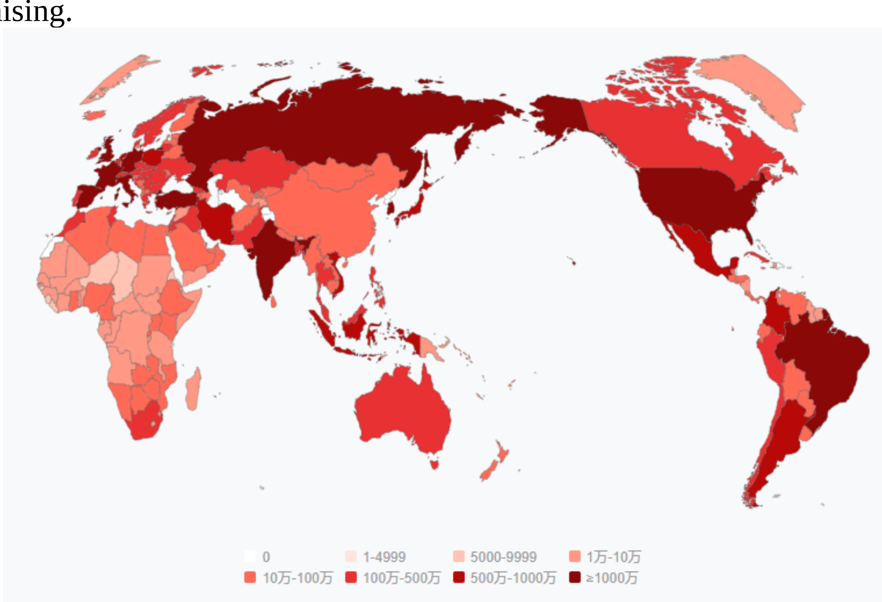
Fig. 7 Import industry distribution in 2019.
Source: National Bureau of Statistics.

Import breakdown further analysis: As shown in Fig. 7, Mining, chemicals, electrical equipment, and machinery and equipment in 2019 accounted for a high proportion of imports. This reflects that China's manufacturing industry still has some shortcomings, and some areas such as raw materials, parts and components, and production equipment have to rely on imports. In the context of anti-globalization, it is easy to be controlled by others.

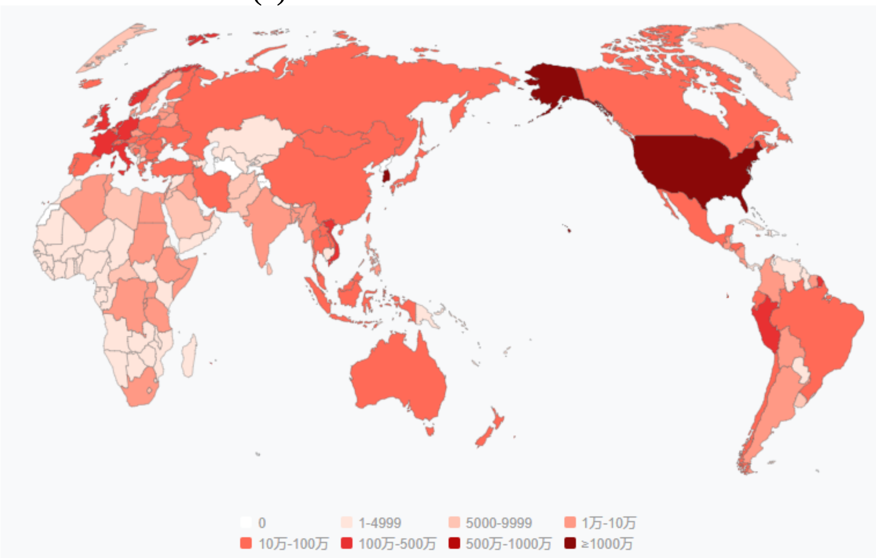
3. The impact of COVID-19 on GVCS and challenges for China

3.1 The impact of COVID-19 on GVCs

The darker the color on the map (Fig. 8), the more people are diagnosed. We can see in Fig. 8(a) several of the most affected regions, namely the United States, India, Brazil, and Russia. They occupy a much larger part of the map. In Fig. 8(b), we can see that the United States is still the country with the highest number of confirmed cases. Except for Africa, the global situation to control the epidemic is still not promising.



(a) Cumulative confirmed cases



(b) Existing confirmed cases

Fig. 8 World Epidemic Map (As of March 28, 2022)

Source: Centers for Disease Control and Prevention.

Table 1. Top 10 countries by cumulative confirmed cases (As of March 28, 2022)

Order	Outbreak	Accumulation	In Existence	Cure	Death
1	The United States	81621888	16161395	64457026	1003467
2	India	43020723	15828	42483829	521066
3	Brazil	29842418	686024	28497468	658926
4	France	25029573	1957751	22930150	141672
5	The United Kingdom	20691123	1743492	18783177	164454
6	Germany	20251037	4248690	15873400	128947
7	Russia	17762742	741160	16654231	367351
8	Turkey	14800677	246020	14456857	97800
9	Italy	14364723	1262891	12943050	158782
10	Korea	12003054	11018344	969524	15186

Source: Centers for Disease Control and Prevention.

We selected the top 10 countries based on the cumulative number of confirmed cases (Table 1). The United States has more than 81 million cumulative confirmed cases and more than 16 million cumulative confirmed cases. Second, India has more than 43 million cumulative confirmed cases. The epidemic is still spreading in Europe and the Americas. As of March 28, 2022, there are approximately 479 million cumulative confirmed cases and approximately 6.12 million cumulative deaths worldwide. At the same time, these countries are very important on the world economic stage. Supply shocks and demand shocks in these countries will lead to major depression in the world economy.

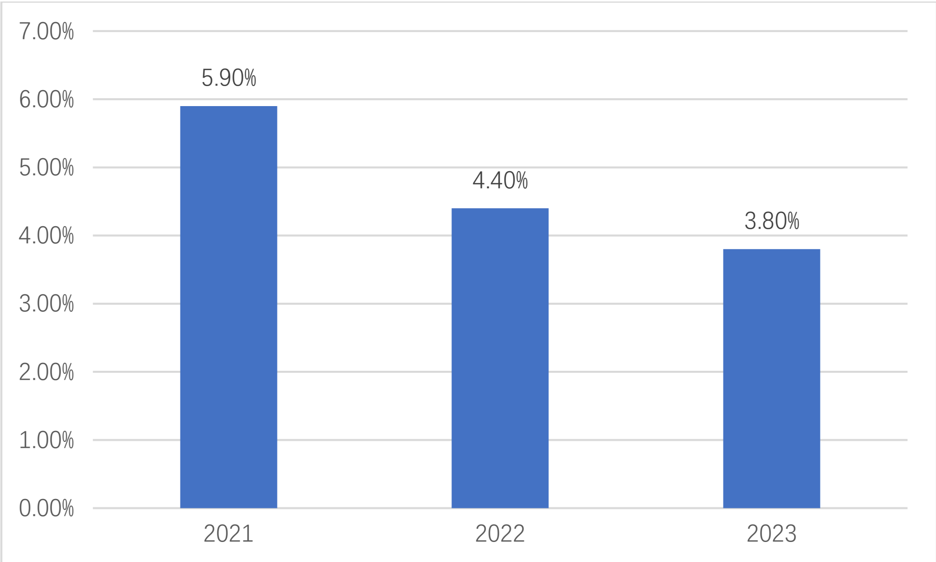


Fig. 9 Global growth forecast (2021-2023)
Source: World economic outlook (Jan 2022) from IMF

Global growth is expected to slow from 5.9% in 2021 to 4.4% in 2022 (Fig. 9). We have lowered our growth forecast for 2022 by 0.5 percentage points from the October 2021 World Economic Outlook, mainly due to lower growth expectations for the two largest economies. In China, we have lowered growth expectations by 0.8 percentage points due to disruptions in economic activity caused by the "zero tolerance" policy and continued financial pressure on real estate developers. Global economic growth is expected to slow to 3.8% by 2023. While this is 0.2 percentage points higher than the previous forecast, it is largely due to a natural pickup in growth as current dampening factors recede in the second half of 2022.

Table 2. The forecast growth rate of economies

% GDP	2021	2022	2023
World	5.9	4.4	3.8
PRC	8.1	4.8	5.2
United States	5.6	4	2.6
ASEAN	3.1	5.6	6
Eurozone	5.2	3.9	2.5
Japanese	1.6	3.3	1.8

Source: World economic outlook (Jan 2022) from IMF

Current supply chain disruptions and rising energy prices will continue into 2022, and in this environment, high inflation is expected to last longer than October 2021. Assuming inflation expectations continue to be well anchored, inflation should gradually decline as supply and demand imbalances ease in 2022 and monetary policies in major economies respond.

The risks to the global baseline forecast are skewed to the downside. The emergence of a new mutant strain could prolong the outbreak and destabilize the economy again. In addition, supply chain disruptions, energy price volatility, and local wage pressures imply considerable uncertainty about the path of inflation and policy. Interest rate hikes in developed economies could raise financial stability risks and could put capital flows, and monetary and fiscal positions in emerging markets, and developing economies at risk, especially given the sharp rise in debt levels over the past two years. Geopolitical tensions remain, making it likely that other global risks will come to the fore. In addition, the current climate crisis means that the likelihood of major natural disasters remains high.

3.2 Challenges for China

The Newcastle pneumonia outbreak is one of the biggest "black swan" events for the world economy in 2020. The sudden outbreak has also had an impact on China's foreign trade structure. On the one hand, the frequency of international exchanges of people and goods has directly decreased due to the escalation of preventive and control measures in various countries. On the other hand, the U.S. has been fomenting negative public opinion against China's epidemic prevention and is making significant adjustments to the international trade landscape.

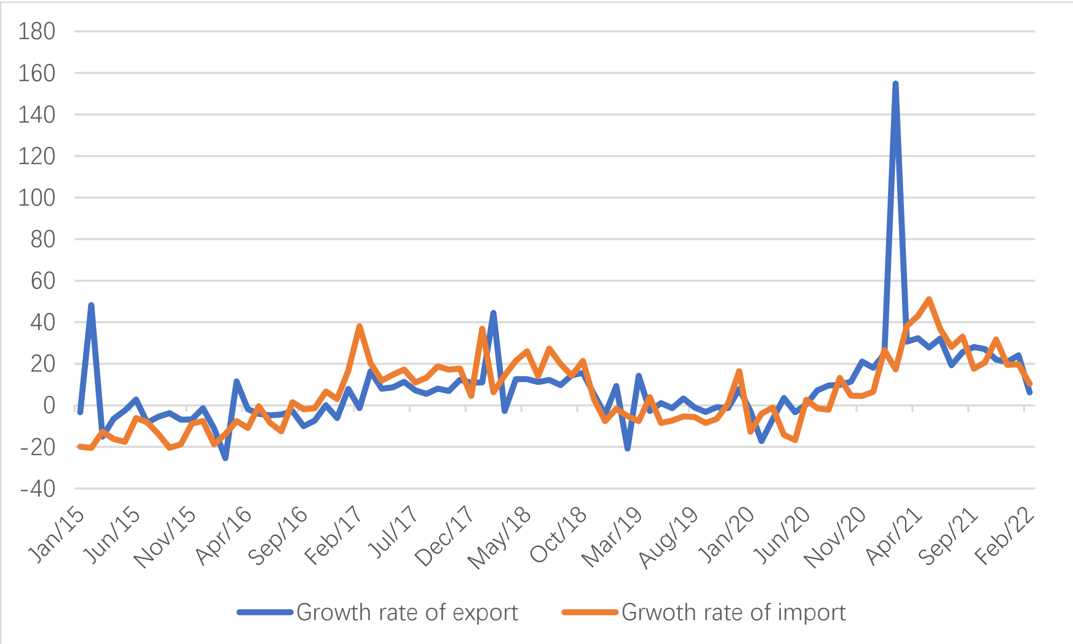


Fig. 10 Growth rates of export and import from January 2015 to February 2022
Source: National Bureau of Statistics.

As shown in Fig. 10, the epidemic has a greater impact on China's foreign trade growth in the first half of 2020 and a greater impact on imports. after the second half of 2020, the growth rate of imports and exports grows slowly, especially export growth peaking at 154.9% in January 2021. Imports reach a peak of 51.5% in May 2021. Since then, import and export growth rates have declined, but are generally better than at the beginning of the epidemic. However, this does not mean that both China's external and domestic demand have fundamentally improved, and China's foreign trade still faces greater downward pressure in the future.

We mainly choose the year-on-year growth rate of foreign trade industry data in March 2020 for comparison to analyze some key features of the impact of the overseas spread of the epidemic on China's foreign trade structure. March 2020 was chosen because the overseas epidemic started spreading around mid-to-late February and by March, most overseas countries had taken preventive measures to vary degrees. To some extent, we can observe the impact of the epidemic on the structure of China's foreign trade, while some countries in Europe and the United States relaxed their epidemic prevention and control measures from mid-April onwards.

Table 3. Growth rates of China's imports and exports by sector in March 2020

Industries	Export (One billion US dollars)			Import (One billion US dollars)		
	Mar-19	Mar-20	Growth rate	Mar-19	Mar-20	Growth rate
Agriculture	6.33	6.57	3.7%	9.72	11.61	19.5%
Mining	5.32	5.21	-2.0%	39.91	36.93	-7.5%
Steel	9.28	9.06	-2.4%	2.61	3.13	19.9%
Non-ferrous metals	5.65	5.62	-0.6%	4.96	5.04	1.6%
Chemical	21.24	23.12	8.8%	20.45	20.64	1.0%
Cement and glass	3.87	3.83	-1.1%	0.90	0.94	4.6%
Electrical equipment	53.66	50.06	-6.7%	38.91	45.40	16.7%
Mechanical equipment	36.37	32.23	-11.4%	16.10	15.92	-1.2%
Electronics	6.70	6.12	-8.6%	8.71	8.33	-4.4%
Transport equipment	8.63	7.57	-12.2%	8.20	5.63	-31.3%
Traditional intensive labor industries	39.19	33.72	-14.0%	8.53	8.38	-1.7%
Others	2.42	2.04	-15.9%	6.99	3.27	-53.2%

Source: National Bureau of Statistics.

In terms of import and export growth by industry, export growth slowed significantly in all industries except agriculture and chemicals, with downstream manufacturing (electromechanical products and traditional labor-intensive products) experiencing the most pronounced contraction in demand. The growth rate of imports of agriculture, upstream, midstream manufacturing, and electrical equipment rebounded significantly, but the decline in the growth rate of mining imports was directly related to the plunge in oil prices. As shown in Table 3, export growth slowed across the board, except for agriculture and chemicals. As the epidemic spread overseas, countries took varying degrees of quarantine measures to ensure food supplies, increasing China's imports of agricultural products. China's export growth for chemicals increased significantly, primarily due to export demand for masks, disinfectants, and other medical protective materials. Export growth slowed across the board, except for agriculture and chemicals, suggesting a significant reduction in overseas demand for alternative consumption with the implementation of domestic quarantine measures. In particular, demand for electromechanical and traditional labor-intensive products shrank much more than in the real estate and infrastructure sectors.

Table 4. The growth rate of China's exports to major countries in March 2020

Industries	America	EU	Japan	Korea	Seven Southeast Asian countries
Agriculture	16.2%	4.0%	3.7%	-17.1%	15.2%
Mining	-59.9%	18.1%	85.9%	-13.2%	-12.1%
Steel	-11.9%	-20.9%	-5.5%	0.6%	14.5%
Non-ferrous metals	-12.1%	-7.9%	-4.6%	12.1%	7.2%
Chemical	-6.2%	-1.1%	-0.5%	30.2%	32.6%
Cement and glass	-12.6%	-20.0%	0.2%	14.1%	10.2%
Electrical equipment	-21.1%	-15.1%	6.1%	-6.4%	10.1%
Mechanical equipment	-23.2%	-15.1%	-12.4%	-7.4%	4.9%
Electronics	-21.1%	-17.1%	-10.4%	-16.9%	8.6%
Transport equipment	-25.7%	-18.7%	-4.8%	41.2%	-17.5%
Traditional intensive labor industries	-27.5%	-16.4%	-4.3%	5.0%	-1.1%
Others	-0.3%	58.7%	5.6%	29.4%	97.0%
Total	-20.8%	-13.1%	-1.4%	1.4%	7.9%

Source: National Bureau of Statistics.

Looking at the growth rate of China's export industries in different regions, the growth rate of China's exports to the U.S. and the EU (including the U.K.) declined rapidly, mainly due to a sharp decline in demand for manufacturing exports. Japan's upstream manufacturing industry dominates, with most downstream exports of electromechanical products growing at a significantly lower rate.

Korea's exports (mainly agriculture, mining, and most E&E products) slowed sharply. The seven Southeast Asian countries' exports bucked the trend by growing significantly, mainly in agriculture and manufacturing, as well as upstream and some downstream E&E products. As shown in Table 4, only China's agricultural exports to the United States grew by 16.2%. This suggests that the cyclical closure of the domestic food supply chain in the U.S. during the epidemic has further increased U.S. dependence on food imports. In addition to mining, transportation equipment, and traditional labor-intensive products, China's export growth to seven Southeast Asian countries increased.

Table 5. The growth rate of China's imports to major countries in March 2020

Industries	America	EU	Japan	Korea	Seven Southeast Asian countries
Agriculture	34.0%	58.4%	-4.8%	27.3%	7.6%
Mining	47.9%	-3.4%	-33.4%	-2.5%	-19.1%
Steel	-2.3%	-4.0%	19.0%	-8.0%	81.4%
Non-ferrous metals	-9.2%	-2.7%	1.4%	-7.8%	49.9%
Chemical	2.8%	17.3%	-0.5%	-9.8%	-10.8%
Cement and glass	-11.2%	-9.4%	-16.8%	11.9%	23.0%
Electrical equipment	0.1%	11.2%	15.5%	8.8%	30.2%
Mechanical equipment	8.1%	-7.8%	-3.9%	-12.5%	19.3%
Electronics	-6.1%	-10.1%	8.0%	-15.6%	13.9%
Transport equipment	-66.2%	-24.6%	13.9%	-36.6%	90.8%
Traditional intensive labor industries	-8.8%	-4.4%	-4.8%	-0.1%	10.8%
Others	33.8%	42.8%	35.0%	-74.9%	-75.7%
Total	-12.8%	1.7%	4.8%	-1.8%	11.9%

Source: National Bureau of Statistics.

As shown in Table 5, the growth rate of China's import industries in different regions shows that China's agricultural and mining imports to the United States grew at a significantly higher rate. This may be related to the first phase of the U.S.-China trade agreement, but the growth of most U.S. manufacturing imports slowed significantly. Imports of agricultural, chemical, and electrical equipment to the EU (including the UK) increased significantly. Import growth of electrical and mechanical products upstream and mostly downstream of manufacturing in Japan increased significantly. Imports of agricultural products, cement, glass, and electrical appliances increased significantly. Most industries in seven countries in Southeast Asia saw a significant increase in import growth.

Overall, the epidemic caused a slowdown in the growth of China's imports and exports to the US, with exports being hit harder. Exports to the EU (including the UK) have taken a hit. However, the epidemic appears to have accelerated China's trade with the Asia-Pacific region, and the development of regional trade integration may be a more prominent feature going forward. The epidemic caused a significant slowdown in the growth of China's exports to Europe and the United States, especially in the manufacturing sector. Import growth in the U.S. did not decline as much as export growth. Imports from the EU grew slightly. However, the epidemic appears to have accelerated trade flows in the region. China's import and export growth rates to Japan and South Korea remained normal, and trade with seven Southeast Asian countries grew sharply.

As COVID-19 spreads around the world, trade in the Asia-Pacific region has become more intense. There are three possible reasons for this: First, the lack of global leadership and even apparent racist tendencies in the United States during the epidemic forced Asia-Pacific countries to reconsider their trade strategies. Second, trade between China and Asia-Pacific countries is very frequent, and most of them have preferential trade facilitation policies that accelerate the flow of capital, goods, people, technology, and other factors in the Asia-Pacific region. Third, compared with developing countries in Europe and the United States, the Asia-Pacific region has relatively better epidemic prevention and control capabilities and has more energy to restore order in social production and life. The economy may be the first to recover. Therefore, it is not difficult to foresee that the trend of regional trade integration may become more obvious in the future.

4. China’s countermeasures

Currently, China is deeply integrated into the international division of labor system. In the short term, the new crown pneumonia epidemic will continue to spread globally, and economic globalization still faces great uncertainty. We also need to strengthen policy guidance, improve industrial innovation capacity, and accelerate the construction of domestic and international dual cycles.

4.1 Boost consumption

We will accelerate the release of domestic demand potential to provide strong support for the stable operation of the economy. Consumption is an important component of economic growth. The 2019 coronavirus disease pandemic has had a significant impact on services such as restaurants, entertainment, and finance.[12] Due to the decline in income and demand, it will be gradually transmitted to the upstream of the industry chain in the medium and long term, leading to a decline in the supply of some manufacturing industries. First, we should deepen the reform of production factors and improve the social employment guarantee system. While expanding domestic demand, it is necessary to open up the various links of production, distribution, and consumption, and improve the circulation efficiency of the main domestic circulation agents. Second, give full play to the role of the platform economy, expand the combination of online and offline new models and new business models, and release the potential of domestic demand in all aspects. Both provide strong support for the economy to stabilize and improve. Third, promote consumption upgrading and improve the speed, quality, and service capability of product innovation. Tapping and stimulating the potential of domestic demand and forming a strong domestic market.

4.2 Cooperation with foreign countries

At present, China is in a critical stage of transformation and upgrading, moving towards high-quality development, and it is more important to recognize China's position in the global value chain. China should be more active, broader, and deeper in opening up cooperation with the outside world. First, further, strengthen the close ties with the "Belt and Road" economies and establish high-quality cooperation mechanisms. China can strengthen its cooperation with the EU through countries along the Belt and Road. Second, strengthen economic and trade ties with developing countries. Through investment, aid, technical cooperation, etc., China can gain access to markets and strategic resources. Third, actively participate in regional free trade agreements. Through open cooperation, China can attract high-end industries to China and gather technology, talents, capital, and other innovative elements to fill the gap of high-end industries in China.

5. Conclusions

From 2007 to 2007, global value chains, especially complex global value chains, grew faster than world GDP. When the global economic crisis hit in 2009, the development of GVCs declined, but then boomed again from 2010 to 2011, after which growth was very slow. Most of the global value chains are in regional value chains. The growth of intra-Asian value chain trade reflects the industrial upgrading of Asian countries such as China. The decline in intra-value chain trade in Europe and the Americas reflects the gradual strengthening of production linkages between Europe and the United States and Asia. China is rapidly becoming the center of traditional trade and simple GVC networks, while the United States and Germany remain at the center of complex GVCs.

While stabilizing global trade growth in the second half of 2021, which is driven by positive international trade growth in 2021 due to epidemic restrictions, economic stimulus packages, and rising commodity prices, the economic recovery slows, logistics networks are disrupted, and transportation costs rise. Factors such as geopolitical conflicts and factors affecting international trade policies will make the outlook for global trade in 2022 uncertain, with varying levels of trade growth between countries. The value chain is local, exclusive, and value-oriented, with more emphasis on security and national interests. Therefore, China must build new industrial chains, supply chains, and value chains, and pay more attention to fostering resilience, flexibility, and diversity in supply chains.

References

[1] McKibbin W., Fernando R. The Global Macroeconomic Impacts of COVID-19: Seven Scenarios. Working Paper, 2020.

[2] Maliszewska M., Mattoo A., &Van Der Mensbrugghe D. The Potential Impact of COVID-19 on GDP and Trade: A Preliminary Assessment. 2020.

[3] ZHU Kunfu, GAO Xiang, YANG Cuihong, WANG Shouyang. The COVID-19 Shock on Global Production Chains and Risk of Accelerated China's Industrial Chains Outflow. Bulletin of Chinese Academy of Sciences, 2020, 35(3): 283-288.

[4] Gereffi G. What Does the COVID-19 Pandemic Teach Us About Global Value Chains? The Case of Medical Supplies. Journal of International Business Policy, 2020, (3): 287~301.

[5] Wang Z., Wei S.J., Yu X., et al. Measures of Participation in Global Value Chains and Global Business Cycles. National Bureau of Economic Research, 2017.

[6] Fornaro L., Wolf M. Covid-19 Coronavirus and Macroeconomic Policy. Economic Working Paper, 2020.

[7] ZHOU Chenghu, PEI Tao, DU Yunyan, CHEN Jie, XU Jun, WANG Jiaoe, ZHANG Guoyi, SU Fenzhen, SONG Ci, YI Jiawei, MA Ting, GE Yong, ZHANG An, JIANG Lili. Big Data Analysis on COVID-19 Epidemic and Suggestions on Regional Prevention and Control Policy [J]. Bulletin of Chinese Academy of Sciences, 2020, 35(2): 200-203.

[8] Wren-Lewis S. The Economic Effects of a Pandemic. Economics in the Time of COVID-19, CEPR, 2020: 109~112.

[9] Baldwin R., Tomiura E. Thinking Ahead About the Trade Impact of COVID-19. Economics in the Time of COVID-19, 2020: 59.

[10] Bems R, Johnson R.C., Yi K.M. Demand Spillovers and the Collapse of Trade in the Global Recession. IMF Economic Review, 2010, 58 (2): 295~326.

[11] JU Jian, Yu Xinding, LU Bing, Li Xin. Analysis of the "Tripod" pattern in global value chain networks. China Journal of Economics, Vol.7, No.4: 1-20, December 2020.

[12] SUN Jiaze, LI Huijuan, YANG Jun. The Impact of the New Coronary Pneumonia Outbreak on Global Macroeconomic and Value Chain Structure. Research on Financial Economic Issues, Number 1 (General Serial No. 458), January 2022.