

Comparative Analysis of macroeconomic between China and the United States before and after the COVID-19 pandemic

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Abstract. As the two largest economies in the world, China and the United States together account for more than 40% of the world's GDP. Since the outbreak of the COVID-19 epidemic in 2020, whether the economic development of China and the United States has been affected by the epidemic, the degree of impact and the degree of economic recovery have attracted worldwide attention. This essay collects macro indicators such as GDP, unemployment rate and CPI in China and the United States in the past five years from the official websites of the U.S. Bureau of Labor Statistics and the National Bureau of Statistics of China. Combined with the research results of existing scholars, a comparative analysis of the economic conditions of the two countries before and after the epidemic was carried out. It is found that in 2020, when the economies of the two countries are affected by the epidemic, the relative decline is smaller and the decline in the United States is larger; when the economies of the two countries rebound in 2021, the absolute level of China's economic growth is significantly higher than that of the United States, but the relative recovery is smaller than that of the America is bigger. In the post-pandemic era, the United States has experienced staggering inflation. After the problem is found, this essay explains the cause of the problem and proposes a solution.

Keywords: Sino-US economy; Prediction Model; comparison; Macroeconomic Indicators.

1. Introduction

At the end of 2019, the first case of COVID-19 was reported in Wuhan, China. 2020, the COVID-19 epidemic broke out all over the world. As of July 2022, the cumulative number of confirmed cases in the world has exceeded 590 million. In the process of fighting against the epidemic, it can be said that all countries in the world have been hit to varying degrees in different fields. As far as the government is concerned, how coordinated the national resources to fight the epidemic; how to ensure people's livelihood and how to designate new policies to ensure the smooth operation of the national economy are all problems need to be considered. For the public, living habits and thinking methods will be affected by the epidemic. Fortunately, to 2022, all world countries gradually have a more comprehensive understanding of the new coronavirus. With the development and popularization of vaccines and the strengthening of people's awareness of protection, the global economy has also recovered in the post-epidemic era. As two important economic powers in the world, China and the United States have adopted completely different responses to the epidemic due to their different national conditions and political systems. China responded aggressively after the case was discovered and headed against the impact of the epidemic. The United States regards the COVID-19 pandemic as an influenza and does not control it too much. Under the guidance of these two epidemic prevention attitudes, the social and economic development of China and the United States naturally show different trends. To intuitively understand how the macroeconomics of the two countries developed during the entire epidemic process, it is necessary to compare the macroeconomic indicators of the two countries before and after the epidemic. This is the most direct way.

Now, many scholars have started to analyze and compare the two countries from the perspective of macro policy. Yan Shushan et al. (2020) firstly analyzed the characteristics of China's macro economy under the epidemic, and then analyzed the impact of the epidemic on aggregate demand, the impact of the epidemic on total supply, the impact of the epidemic on inflation and employment, and the impact of the epidemic on regional and industrial economies. This paper analyzes the impact of the COVID-19 pandemic on China's macro economy in five aspects, and the impact of the epidemic

on enterprises. Finally put forward countermeasures [1]. Yang Panpan et al. (2021) mainly analyzed and reviewed the monetary and fiscal policies of the United States since the outbreak of the COVID-19 pandemic. It specifically analyzes the five rounds of monetary policy adopted by the United States in response to the COVID-19 pandemic, as well as the fiscal policy that mainly guarantees the survival of households and small and medium-sized enterprises [2]. Rong Shengliu et al. (2021) compared the fiscal and monetary policies of China and the United States in response to the epidemic, and pointed out the similarities and differences [3]. They also analyze the effects of the policies adopted by the two countries and seeks for commonalities and differences. Finally, they put forward an outlook on the policies of the two countries. These scholars all focus on the macro policy analysis of the two countries, but the comparison of the effect before and after implementation is not obvious. Although some macroeconomic measurement indicators are used in these articles to illustrate, the comparison of relevant macroeconomic indicators before and after the epidemic is not enough, and the comparison of economic development and recovery before and after the epidemic between the two countries is not intuitive enough.

Therefore, this paper will directly compare the economic development recovery of China and the United States with the different economic indicators before and after the COVID-19 epidemic. This study will mainly compare the macro indicators such as GDP, unemployment rate, employment rate, inflation rate, price consumption index and so on between the two countries. Then, under each index, combining with the existing scholars' research on the macro policies of the two countries to explain and analyses the reasons why each index presents the same or different trends. Try to find out the similarities and differences between the two countries. At the same time, because China and the United States are typical socialist countries and capitalist countries respectively, the author also expects to put forward some economic recovery methods suitable for different types of countries through the comparative analysis of the two countries. Hope to give some recovery suggestions to countries whose economies have been greatly affected by the COVID-19 epidemic.

2. Description of China

2.1. GDP

At the beginning of 2020, a sudden COVID-19 pneumonia epidemic disrupted people's normal work and life order. In order to prevent the spread of the epidemic, China's national holidays were extended, and enterprises were suspended, which had adverse effects on all walks of life. At present, the epidemic is still raging around the world, one after another, and has a profound impact on world politics and economy. With the spread of the COVID-19 pneumonia epidemic around the world, the economies of all countries in the world have been impacted, and China has not been spared. In the first quarter of 2020, China's GDP growth rate was -6.9%.

Before the outbreak, in 2019, China's GDP reached 98,651.52 billion yuan, ranking second in the world, with a per capita GDP of 70,892 yuan, reaching the \$10,000 level for the first time. However, the sudden COVID-19 pneumonia epidemic broke this good development momentum. According to the empirical analysis by scholars such as Shouxi Li and others (2022), China's GDP in the first quarter of 2020 was most affected by the epidemic, and the actual value was 3,109.59 billion yuan less than the predicted value. With the gradual resumption of work and production, the impact of the epidemic on GDP will gradually decrease. However, from the first quarter of 2020 to the third quarter of 2021, the GDP reduced due to the impact of the epidemic was 9,042.27 billion yuan, and the total amount should not be underestimated [4].

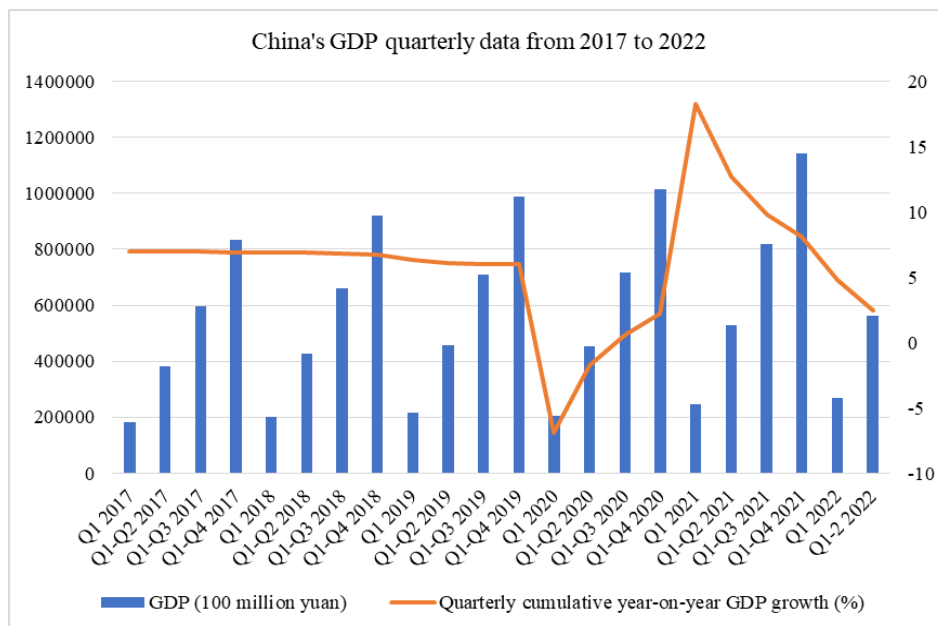


Figure 1. China's GDP quarterly data from 2017 to 2022.

2.2. Unemployment rate

The chart below shows the change in the unemployment rate of China's urban population from 2018 to the present. Of particular note is the unemployment rate before and after the pandemic. Before the pandemic, China's employment rate had been fluctuating around 5%. China's urban unemployment rate has risen sharply since the outbreak of COVID-19 in February 2020 and remained at a high level in the first half of 2020. From February to June 2020, China's urban unemployment rate averaged 5.94 percent, up 0.82 percentage points from the same period in 2019. China's employment rate began to improve in the second half of 2020. From July to December 2020, the number of new urban jobs in China reached 6.22 million, surpassing the 6.15 million in the same period of 2019. The number of unemployed urban people reemployed reached 2.98 million, surpassing the 2.8 million in the same period of 2019. Driven by employment growth, China's urban unemployment rate has gradually decreased and stabilized. From July to December 2020, the surveyed urban unemployment rate in China and the surveyed urban unemployment rate in 31 major cities averaged 5.40 percent and 5.43 percent, respectively, close to 5.18 percent and 5.17 percent in the same period of 2019. Accordingly, the statistical comparison shows that the COVID-19 outbreak had a significant adverse impact on China's employment situation in 2020, but its impact tended to ease in the second half of the year [5].



Figure 2. Unemployment rate in China (January 2018-July 2022).

2.3. CPI

Before the pandemic, China's CPI index fluctuated around 2%, usually less than 2%. February 2018 was the highest CPI in China before the pandemic. This is mainly influenced by Spring Festival and low temperature [6]. First, the large-scale cold weather across the country affected the production and transportation of some agricultural products. Coupled with the increase in demand and consumption during the Spring Festival, food prices rose by 4.4%, affecting the CPI by about 0.88 percentage points. Second, more people travel around the Spring Festival, pushing up the prices of transportation and tourism, air tickets and long-distance bus tickets

In early 2020, China's CPI rose 1.4 % month-on-month and 5.4 % year on year. Food prices rose 4.4 % month-on-month and 20.6 per cent year-on-year. Pork prices rose 116 % year on year, while vegetable prices rose 17.1 %. There is no doubt that the rise in CPI is influenced by the epidemic. After the outbreak of the epidemic, people are generally more panic, mass hoarding of food, daily necessities and so on, causing inflation. Pork is the most representative. Throughout 2020, China's CPI generally showed a downward trend, reaching the lowest point in nearly five years in November 2020, down 0.5% year on year. After 2021, the CPI basically showed an upward trend, and recently recovered to the pre-pandemic level.



Figure 3. Monthly Year-on-year rise and fall of China's CPI in recent five years (%).

3. Description of USA

3.1. GDP

Before the fourth quarter of 2019, before the epidemic, the overall USA economy showed an upward trend. Although the GDP growth rate is relatively slow, it also maintains positive growth every quarter. In 2020, when the epidemic broke out, the quarterly GDP growth rate of the USA was negative for two consecutive years. In the second quarter in particular, U.S. GDP fell by 31.2%, the worst recession the U.S. has experienced in the past two centuries. The USA economy contracted sharply in the second quarter, largely related to a sharp drop in consumer spending. Under the epidemic, many states in the United States issued "stay-at-home orders" and closed non-essential business premises [7], which severely hit consumer spending in catering, retail, tourism and other fields, and "turned off" the consumption engine, which accounts for 70% of the US economy. In addition, weak investment and net exports were a drag on second-quarter GDP. By the third quarter of 2020, as the pandemic improved and government policies were liberalized, GDP growth in the United States increased sharply. Note, however, that this big jump is conditional on a big drop in the previous quarter. In subsequent quarters, the U.S. GDP increased slightly compared with the pre-pandemic period, and the growth rate increased to above 0%.

However, in the first and second quarters of 2022, USA GDP growth turned negative again, at -1.6% and -0.9% respectively. Some American media expressed their concern that the two consecutive quarters of negative growth is a sign that the United States has entered a "technical recession" period [8].

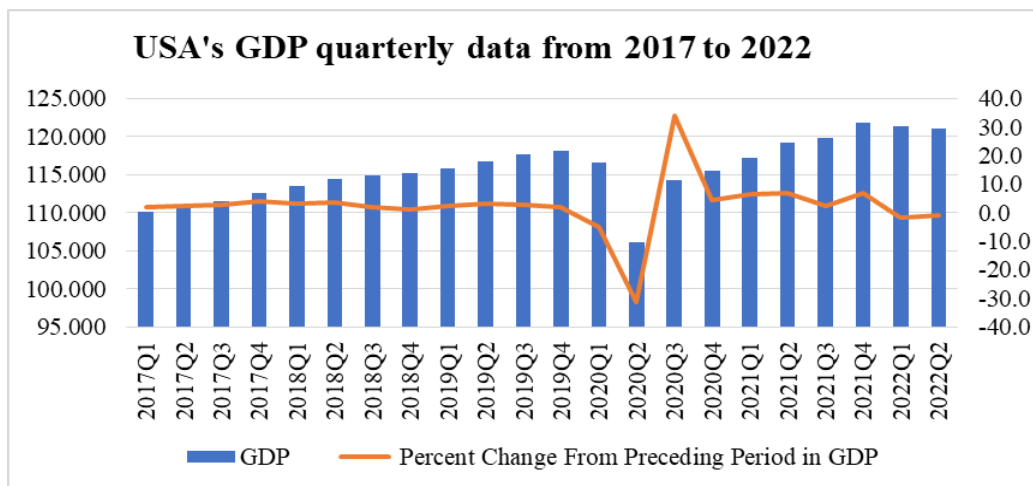


Figure 4. USA's GDP quarterly data from 2017 to 2022.

3.2. Unemployment rate

From the first quarter of 2018 to the first month of 2020, the U.S. unemployment rate remained between 3.5% and 4.1%. The U.S. unemployment rate has been on a roller-coaster ride since 2020. According to data released by the U.S. Department of Labor, the U.S. nonfarm payrolls fell by 20.5 million in April 2020 due to the COVID-19 pandemic and stay-at-home orders, and the unemployment rate rose to 14.7 percent, the highest since the Great Depression of the 1930s. In February 2020, the U.S. unemployment rate was just 3.5%, the lowest in 50 years. Yet in just two months the unemployment rate went from "record low" to "record high", tens of millions of people lost their jobs in a single month, and almost every industry was hit hard.

Unemployment fell in subsequent months, but remained high overall. By September 2021, the U.S. unemployment rate finally fell below 5. Since the end of 2021, the unemployment rate has remained basically the same as before the pandemic. As of July 2022, the U.S. unemployment rate was 3.5%, which has been low throughout history.

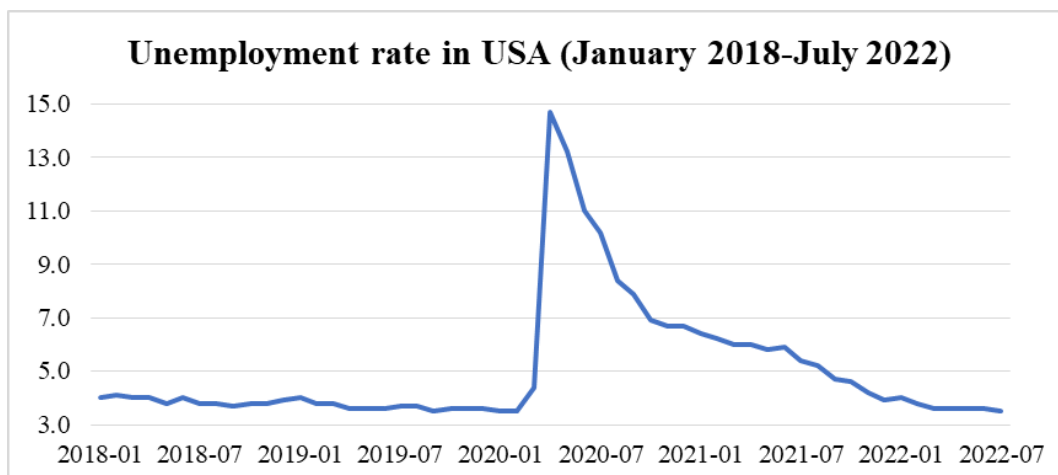


Figure 5. Unemployment rate in USA (January 2018-July 2022).

3.3. CPI

Before the epidemic, the year-on-year CPI growth rate in the United States fluctuated around 2%. By 2020, the impact of the epidemic has declined. Among them, the price increase from April to June

2020, when the epidemic was severe, was the lowest, only 0.3%, 0.1% and 0.6% respectively. Since then, the year-on-year increase in cpi in the United States has been rising all the way and remains high.

According to data released by the US Bureau of Labor Statistics, the US CPI in June 2022 increased by 9.1% year-on-year. The growth rate accelerated again, the fastest growth rate since December 1981. The growth rate was higher than market expectations and also surpassed May's 8.6% rate. As of July 2020, the latest data shows that the year-on-year growth rate of the US CPI has exceeded 6% for 10 consecutive months. Relevant scholars pointed out that the CPI rise in the United States was mainly affected by the epidemic and the conflict between Russia and Ukraine [9]. On the one hand, since the 2020 epidemic, the United States has implemented a relatively loose monetary and fiscal policy in order to maintain a certain level of national consumption. However, due to the impact of the epidemic, the supply market cannot meet the demand of the consumer market. As a result, prices rose, and the US CPI rose was increased. On the other hand, the Russian-Ukrainian conflict led to higher energy prices and food prices, which pushed the US CPI up.

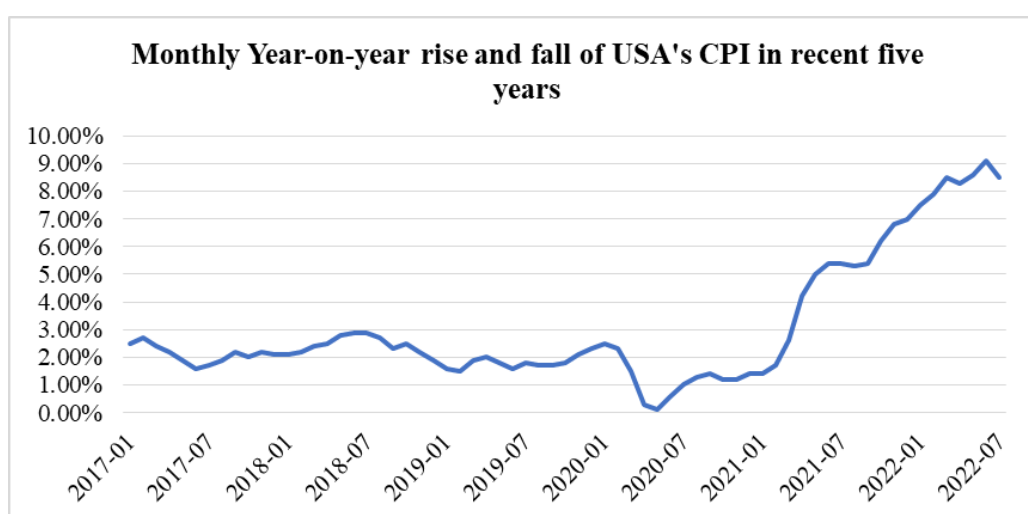


Figure 6. Monthly Year-on-year rise and fall of USA's CPI in recent five years.

4. Conclusions Comparison of China and USA

4.1. Compare results

4.1.1 Analysis of specific indicators

(1) GDP

As shown in the figure below, the GDP growth rates of both China and the United States were relatively stable before the epidemic, and China was higher than the United States. Since the outbreak of the epidemic, the U.S. GDP growth rate has fluctuated more and changed faster than China's. At the beginning of the epidemic, China's economic growth rate was the first to be hit. In the first quarter of 2020, the GDP growth rate in China was the slowest at -6.9%. The U.S. was hit hardest in the second quarter of 2020, with GDP growth falling to 31.2%. But the U.S. economy is also recovering faster. In the third quarter of 2020, USA's GDP growth reached the highest level since the epidemic, at 33.8%. China did not reach its peak post-pandemic GDP growth rate of 18.3% until the first quarter of 2021. As of the second quarter of 2022, the growth rate of GDP in both China and the United States has shown a slowing trend. However, they are all lower than the growth rate of GDP before the epidemic, and this indicator in the United States is still negative.



Figure 7. Comparison of quarterly GDP growth rates between China and the United States in the past five years(%).

(2) Unemployment rate

As shown in the chart below, the unemployment rate in both China and the United States was relatively stable before the epidemic. China is stable at around 5% and the US at around 4%. In 2020 after the outbreak, the unemployment rate in the United States has soared compared to China. The U.S. unemployment rate reached 14.7% in April 2020, and the peak in China occurred in February 2020 at 6.2%. In terms of timeliness, the main impact period of the epidemic on the unemployment rate in the United States is from April to December 2020, a total of 9 months; the main impact period of the epidemic on the unemployment rate in China is from February to September 2020, a total of 8 months moon. Some scholars have calculated that the total loss caused by the epidemic to the unemployment rate in China is 1.23%, while the total loss to the unemployment rate in the United States is 10.51%. In general, China's unemployment rate is far less affected by the epidemic than the US unemployment rate [10].

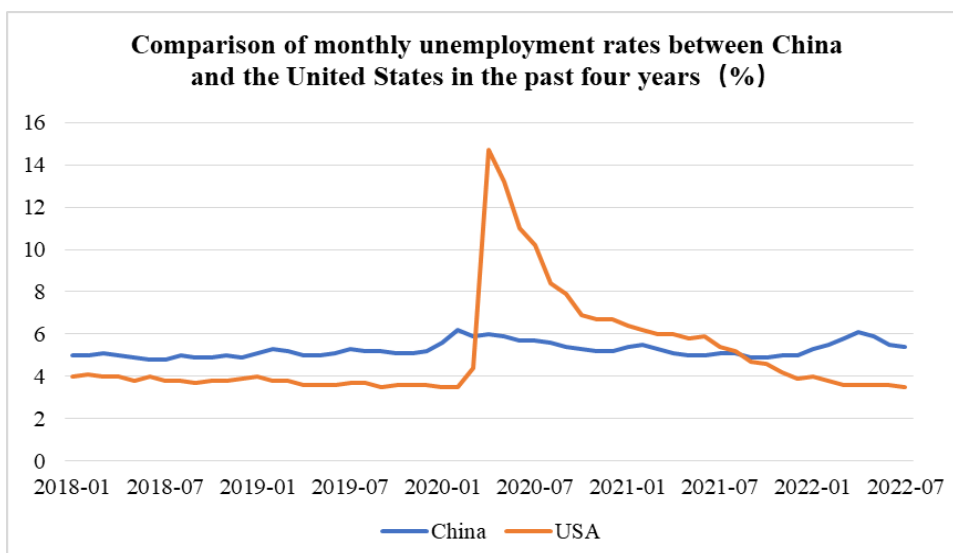


Figure 8. Comparison of monthly unemployment rates between China and the United States in the past four years(%).

(3) CPI

Before the epidemic, the CPI of China and the United States showed a basically stable trend with slight fluctuations. After the outbreak of the epidemic, the CPI trends of the two countries were basically the same. Both peaked in January 2020 and peaked in May 2020. However, after 2021, when the epidemic is basically under control, the CPI trends of the two countries will be very different.

China's CPI index is slightly lower, but has basically returned to the pre-epidemic level. The US CPI index has been soaring and inflation is serious [11].

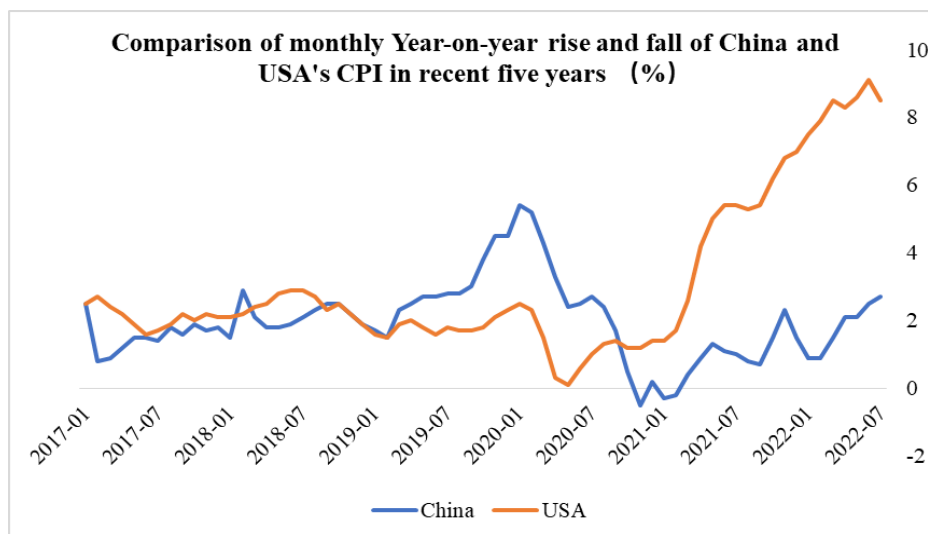


Figure 9. Comparison of monthly Year-on-year rise and fall of China and USA's CPI in recent five years (%).

4.1.2 Existing problems

From the above comparison, we can mainly see the problems between the two countries. The economic development of China and the United States before the epidemic was basically stable, and their trends of GDP growth, unemployment rate, and CPI were relatively consistent. It was only after the outbreak of the epidemic that the two countries showed different trends. According to the size of the impact of the epidemic, the time after the outbreak can be divided into two periods. The first is the whole year of 2020, which is a period when the epidemic has a greater impact. The second paragraph is from 2021 to the present, which is the post-epidemic era. Then in different periods, it can be seen that there are obvious differences between the two countries.

(1) The period when the impact of the epidemic is greater

During this period, both China and the United States were clearly hit by the epidemic. But the difference is that the overall trend of economic development in the United States is slightly behind China. Another obvious feature is that China's economy throughout the epidemic was less volatile than the United States. A typical example is that the U.S. GDP growth rate and unemployment rate both rose and fell significantly during the epidemic.

(2) Post-epidemic era

During this period, countries around the world have a relatively deep understanding of the epidemic. With the popularization of vaccines and the strengthening of people's awareness of protection, the impact of the epidemic is decreasing. It stands to reason that all kinds of economic indicators in China and the United States should return to pre-epidemic levels, but the CPI index in the United States has indeed skyrocketed, which makes people worry about whether this round of inflation in the United States will last for too long.

4.2. Analyze the reasons for the problems

During the epidemic, the main reason for the difference in the speed and extent of economic recovery between China and the United States lies in the different policies formulated by the two countries. Compared with China, the US policy focuses on increasing residents' income and promoting consumption. The degree of accommodative policy in the United States is also different from that in China. China is a gradual adjustment policy; the United States is drastic and unprecedented. U.S. policymakers have shorter policy decisions and implementation times than China, and acted quickly when the outbreak began to spread. It cut interest rates to zero within two

weeks and launched a nearly \$6 trillion fiscal stimulus and rescue plan. These measures have made the US economic indicators volatile.

The root cause of inflation in the United States in the post-epidemic era is the extremely loose fiscal and monetary policies it has implemented since the epidemic. When the signs of inflation appeared, in order to give priority to the recovery of the economy, the United States temporarily gave up the control of the price level. The Fed is sticking to the view of "transient" inflation in 2021. At the same time, the large-scale release of liquidity in the United States has led to a rise in price levels. The United States has adopted an ultra-strong fiscal stimulus plan and ultra-loose monetary policy since March 2020. As of 2021, the size of the Fed's assets has expanded by 110% from the beginning of 2020, an increase of \$4.6 trillion.

4.3. Solution suggestion

At present, China and the United States have different economic development goals and naturally require different approaches.

For China, the most important thing is to achieve stable development. Various economic indicators as of July 2022 show that China's economy has returned to pre-pandemic levels. The Chinese government must persist in optimizing epidemic prevention and control measures, and strive to minimize the impact of the epidemic on the economy. Compared with developed countries, China's total GDP still lags behind. Therefore, China must also tap new momentum for economic growth and continue to stimulate its economic development potential.

For the United States, tackling post-pandemic inflation is a top priority. As mentioned earlier, the inflation in the United States in 2022 is mainly caused by the extremely loose monetary policy of the Federal Reserve. Therefore, the US government should implement a relatively tight monetary policy, that is, the Fed needs to raise interest rates. The Fed is already on the move, raising rates twice as of July 2022 to 0.75%.

5. Conclusion

This article mainly discusses the economic development of China and the United States before and after the COVID-19 epidemic. It focuses on writing by comparing and analyzing the macroeconomic data of the two countries and summarizing relevant literatures. The results showed that the development trends of various economic indicators in China and the United States were basically the same before the epidemic, but they were very different after the epidemic. China's economy has gradually returned to the right track after a period of impact from the epidemic, but the US economy has moved towards serious inflation. Since the political systems of China and the United States are different, it is normal for them to have different trends. Then socialist countries and capitalist countries that are experiencing the epidemic can learn from the conclusions and methods proposed in this study to choose fiscal and monetary policies that are suitable for them during the epidemic, and avoid going on the road of inflation. Of course, this paper also has certain limitations. First of all, this paper only compares three macroeconomic indicators of the two countries in the past five years, and the economic measurement of the whole society is not complete. Secondly, the selection of macroeconomic indicators in the two countries is not completely consistent, and there may be differences in comparison. The author does not directly compare the absolute values of the indicators of the two countries, but compares the growth rate, just want to avoid the gap caused by the different economic size. However, due to the different measurement methods of the data published by the two governments, it is true that the content of the data is not completely comparable. For example, in terms of the unemployment rate, the unemployment rate in China mainly refers to the unemployment rate of the urban population, while the unemployment rate in the United States refers to the unemployment rate of the population over the age of 16. In the future, the author would like to expand the research time range, increase the number of research objects, and increase the number of research

events. Research development economy. Look at the changes and development of the world economy in the long river of history.

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