

# Analysis of the Impact of the Epidemic on the Macro-economy of China and United States

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**Abstract.** In 2020, a COVID-19 epidemic plunged the global economy into recession. As a "global pandemic", the Cliff descent of GDP in various countries have proved the negative impact of the epidemic on the global economy to varying degrees, and the economies of China and the United States are no exception. From the macro-economic perspective, the epidemic is essentially a sudden demand shock. Its negative effects are mainly manifested in the economic crisis caused by insufficient effective demand in the short term from the three demand channels of restraining personal consumption, enterprise investment and net export. Therefore, this paper analyses the influence of the epidemic on the national economy from the perspective of consumption, investment and import and export demand. However, due to the severity of the epidemic, the economic structure of various countries and the different economic policies to deal with the crisis, the economic impact of the epidemic on various countries will be different. Therefore, this paper takes China and the United States as research samples to compare and analyze the impact of the epidemic on different economic entities.

**Keywords:** Epidemic situation; Macroeconomic; Demand shock; Economic structure

## 1. Introduction

At present, the COVID-19 epidemic is still spreading around the world. Even with the popularization of vaccines and the importance of people's protection, the continuously mutated virus makes the epidemic still highly infectious and harmful. This epidemic is not only the biggest global health crisis since the Great Influenza of 1918, but it is also likely to be one of the greatest economic and financial crises in recent history [1]. The impact of COVID-19 on the world economy has been more rapid and more severe than that of 2008 or even the Great Depression, for most of the economic activity has been virtually closed, as has happened in China, the United States, and other large economies. There is no accurate conclusion on the impact and impact of the epidemic on the economy because of the persistence of the epidemic. However, there is no doubt that, in addition to the impact on life, health and social level, the COVID-19 epidemic has caused different impacts on the economies of all countries. This article incline to the points that the essential reason for the impact on the economy is Keynes' interpretation of the economic crisis in 1930, that is, insufficient effective demand. That is to say, all the components of total demand, and imports - are in an unprecedented free-fall. In addition, from the GDP data, the impact of the epidemic on the United States and China is not exactly identical, because there are differences in the economic structure and coping policies of the two countries.

## 2. Analysis of the Impact of the Epidemic in China and United States

A new coronavirus infection was confirmed in Wuhan City in Dec. 2019[2]. Then, the local community spread and the cluster case appeared in Wuhan, and the other areas of Wuhan were also found. The Chinese government has launched a comprehensive campaign to prevent and control epidemics. Subsequently, as a result of the rapid growth in the number of new cases in the country, the situation of prevention and control has become very serious. China has taken the critical step to halt the virus's spread by firmly and decisively closing the exit route from Wuhan, strictly implementing the work stoppage in the outbreak area, strictly controlling the large-scale movement

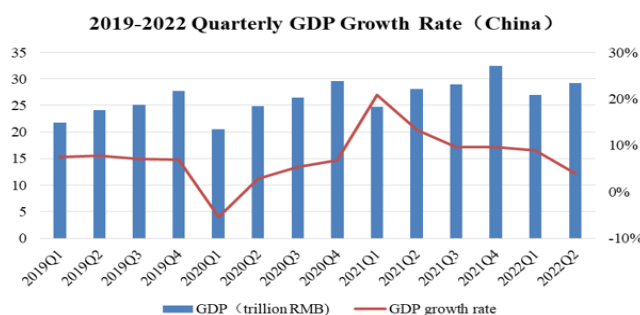
of personnel, and launching emergency response to major public health emergencies in various places. The epidemic's rapid rise has been slowed by a series of prevention and control policies. Except for Hubei Province, China's epidemic situation is generally stable. By the middle of March 2020, the daily number of new cases was under control, and the epidemic's prevention and control saw gradual but considerable improvements. Since then, the epidemic in China has been sporadic, whereas the epidemic in other countries around the world has spread rapidly. For the purpose of strengthening and deepening the effectiveness of the national epidemic control, the Chinese Government has strictly controlled the import of foreign persons and commodities, dealt with the centralized epidemic situation in a timely manner, and promoted the recovery of work and production through classification. Since May 2020, China's epidemic situation has been under control, and the epidemic control has been normalized. However, due to the six months of blockade during the initial outbreak, the near stagnation of production activities has put a heavy burden on the growth of Chinese economy.

The outbreak in the United States was later than that in China. The first verified case of COVID-19 was revealed by the US on January 20, 2020. In March, the epidemic situation in the United States took a sharp turn for the worse, reaching 10000 cases in the middle of March. Meanwhile, on March 13, Trump announced a state of emergency across the country and introduced a series of measures to restrict overseas import and gathering activities. After that, schools began to close down one after another, and economic activities in many regions were shut down. In early April, the number of confirmed COVID-19 cases in the United States soon surpassed 500 thousand, making it the world's most confirmed case. In early August, more than 5 million people were diagnosed in the United States. The epidemic in the United States has not been well suppressed. However, with the widespread vaccination, on April 18, 2022, the United States announced that the last protective barrier - the mandatory order on all masks such as airports, trains and buses - was revoked, which means that daily activities in various regions have completely returned to normal.

## 2.1. Description of GDP

### 2.1.1 China

GDP is the total output of a country (or region) in a given period of time. GDP is a key index of national economic accounting, and it is also an important index to measure the state and level of development of a country. As a result, GDP is an important indicator for measuring the impact of the epidemic on a country's macroeconomics. According to the timeline of epidemic before, the first quarter of 2020 is the period in which China is most severely affected by the epidemic. The sharp drop in GDP also fully proves the strong positive correlation between the impact of the epidemic and the decline in GDP. Compared with the first quarter of 2019, the year-on-year growth rate of China's GDP in the first quarter of 2020 was - 5.5%, and this was the first year-on-year decline since China's GDP accounting, which was sufficient to show that the epidemic had a great impact on China's economic epidemic. However, relatively speaking, this economic shock is short-term, because after the GDP growth rate in the first quarter fell to the lowest point, the GDP growth rate randomly increased rapidly, which is related to China's rapid introduction of a series of economic policies to deal with the epidemic.

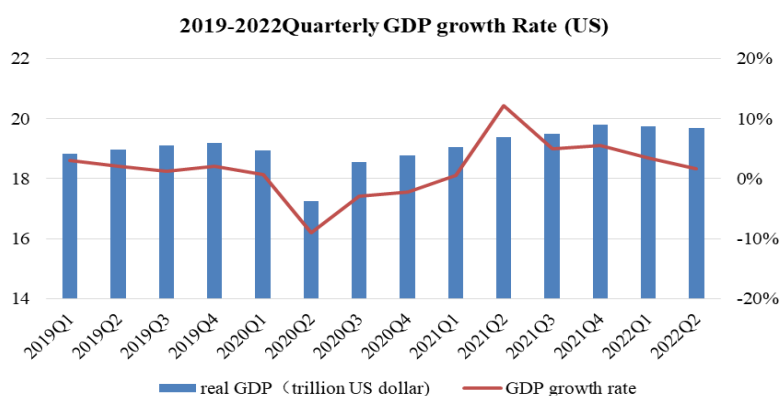


**Figure 1.** 2019-2022 Quarterly GDP Growth Rate (China).

Data resource: National Bureau of Statistics of China

### 2.1.2 U.S.

The United States experienced negative year-on-year growth in the first quarter of 2020, with a quarter on quarter growth rate of - 9% and - 2.8%. From the time point of the last part of the epidemic, the adverse effects of COVID-19 on the U.S. economy will be concentrated between Mar. 14 and 25, 2020. In the meantime, GDP fell sharply, resulting in a substantial decline in GDP growth in first quarter of 2020. It can be seen that the GDP economic data shows that the first quarter of 2020 is the period when the US economy is most affected by the pandemic, which corresponds to the first peak of the COVID-19 epidemic in the United States.



**Figure 2.** 2019-2022 Quarterly GDP growth Rate (US).

Data resource: Statistics Research Department.

## 2.2. Description of Economic Structure

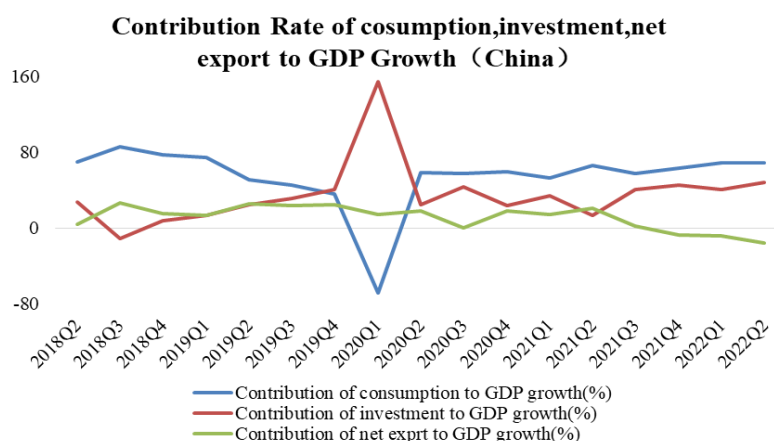
### 2.2.1 China

The impact of the epidemic on China and United States' economic structure is most directly reflected in GDP. The expenditure method calculates GDP by combining consumption expenditure, investment, and net exports of goods and services. The contributions of the three elements to two countries' economic growth are as follows:

In China, from the perspective of consumption, consumption in 2018 and 2019 has always been the largest driver of economic growth. However, the contribution of final consumption to GDP growth rate in 2018-2019 continues to decline over time. In 2020, the Spring Festival holiday coincides with the COVID-19 epidemic. People are generally isolated from one another at home, which disrupts the balance of supply and demand for consumer goods. Food and other commodities have affected the supply and price of commodities, and also the consumption capacity of the people, which has significantly weakened the capacity of GDP growth. Compared with Q1 2019, the share of final consumption expenditure in GDP has fallen from 66.1% to 68.4%, and the year-on-year decline was almost 200%. From an investment standpoint, the GDP growth contribution rate of investment in 2018 and 2019 has consistently lagged behind that of consumption. However, at the height of the epidemic, investment growth's contribution rate to GDP growth reached 150%, making it the main engine of economic expansion. This is mostly because of the enormous support provided by the government and businesses during the epidemic for products that prevent epidemics and provide everyday requirements.

The data on the contribution rate of net exports of goods and services to the total growth of domestic production in 2018 and 2019 demonstrate that net exports in 2019 did not support GDP growth from the standpoint of net exports. Net exports made a positive contribution to the economy in 2019 with a 20 percentage point growth rate. However, net exports decreased by 0.2% in the fourth quarter of 2019. The General Administration of Customs said that in January-February 2020, the total value of imports and exports reached 4.12 trillion yuan, down 9.6 percent from last year. The epidemic's effect on China's exports has already become apparent. Additionally, the World Health Organization declared the new coronavirus epidemic a "international public health emergency" on

January 31, 2020 (PHEIC). Foreign nations will undoubtedly increase the entry hurdle for Chinese goods or forbid them from entering the market, which directly contributed to the decline of the new export order index to 48.7% in January 2020, even though it is not advised to apply travel and trade restrictions. With the "three phase superposition" effect and the strain of the Sino-US trade war already present, this has made China's exports worse. As a result, the third quarter of 2020's GDP growth continued to be negatively impacted by net exports of goods and services.

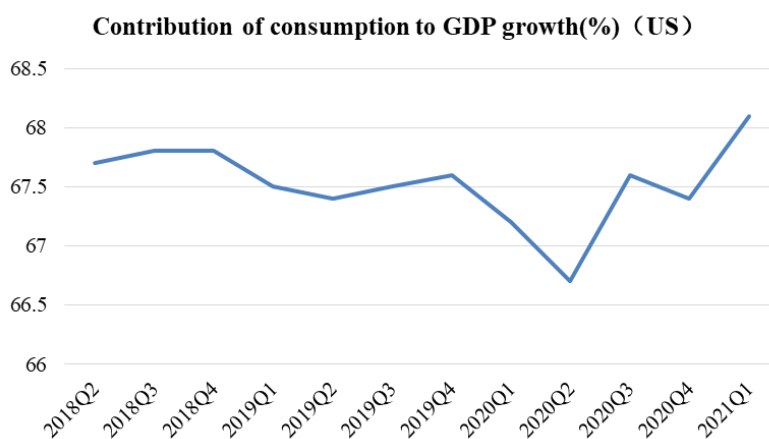


**Figure 3.** Contribution Rate of consumption, investment, net export to GDP Growth (China).

Data resource: National Bureau of Statistics of China

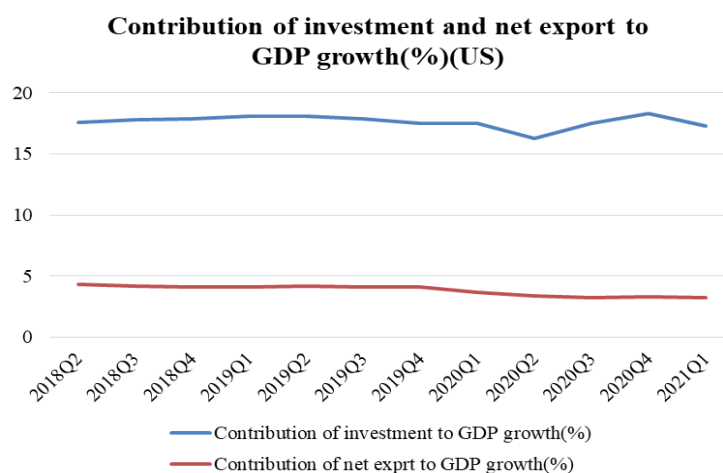
### 2.2.2 U.S.

In the United States, the restrictions on social distance caused by the outbreak of the epidemic have imposed certain restrictions on service consumption in the United States. In the first quarter of 2020, the contribution rate of private service consumption to economy growth in the United States fell to 66.7 percent, almost 1 percent lower than in the 4th quarter of 2019. Although it has obviously recovered from the low point (- 17.4%) in April last year, this indicator has been in a bottleneck since August last year. Before the epidemic, service consumption accounted for 69.4% of personal consumption expenditure in the United States (the third quarter of 2018).



**Figure 4.** Contribution of consumption to GDP growth(%) (US).

Different from China, the contribution rate of investment to GDP growth in the United States is much lower than that of consumption to GDP growth, which has remained between 17% and 18% for a long time. Even during the epidemic period, the contribution rate of investment to GDP and consumption to GDP also decreased. In the second quarter of 2022, the contribution rate of investment to GDP was 16.3%, which was also about 1 percentage point lower. Relatively speaking, the contribution rate of net exports to US GDP is relatively stable, mainly because the contribution rate of net exports is relatively low, which has been within 5%.



**Figure 5.** Contribution of investment and net export to GDP growth (%) (US).

### 3. Comparison Analysis

From the above data analysis, we can see that the epidemic has a great impact on the economy of China and the United States, particularly in the initial phase of the epidemic (the first quarter and the second quarter of 2020). The epidemic led to a 5.5% drop in China's GDP and a 9% drop in the US GDP in the first quarter of 2020. In terms of GDP, the impact of the epidemic on the United States is greater than that on China. From the perspective of economic structure, the epidemic has affected the consumption and investment of China and the United States to varying degrees, including causing the contribution rate of American consumption and investment to economic growth to drop at the same time, causing the contribution rate of Chinese consumption to economic growth to drop sharply, while the contribution rate of investment to economic growth to rise. This can also partly explain that the impact of the epidemic on the American economy is greater than the impact on the Chinese economy. In the economic structure of the United States, the contribution rate of consumption to economic growth is absolutely dominant, while the contribution rate of investment and net exports is not high. The social distance and people's pessimistic expectations in the epidemic directly affect consumer demand [5]. Further, the impact of the epidemic on consumption, investment and net exports can be divided into the following aspects: (1) consumer demand: Although the recession triggered by the pandemic was largely consumer-driven, the relative weight of the contribution of demand components to growth has differed significantly between countries [7]. The epidemic has caused the consumption of American residents to be impacted by the double negative effects of income and wealth. 70% of the GDP of the United States is consumer spending. The driving force for the growth of household consumption in the past 10 years comes from the strong labor market and the solid strength of household balance sheet, which is mainly reflected in the growth of disposable income and the wealth effect driven by asset prices. With the rapid deterioration of the labor market, the impact of the income effect began to lead to a sharp decline in consumer spending and a sharp deterioration in confidence. At the same time, financial assets account for a large proportion of the individual pension in the United States. With the gradual retirement of baby boomers, the proportion of expenditure in their consumption expenditure rises. The elasticity coefficient of consumer expenditure (including non-auto retail expenditure, hotel and air ticket expenditure, etc.) to price changes of financial assets is 13.3 basis points. Therefore, in turn, when the stock market and other markets are greatly reduced by the impact of the epidemic, not only will the market's expectations of the future economic prospects decline, but also will have a direct impact on US consumer consumption. As far as China is concerned, the COVID-19 epidemic has a great impact on China's manufacturing and service sectors, and may have a concentrated explosive effect, causing a reverse impact on consumers' income growth ability, consumer confidence and expectations, and thus greatly weakening the endogenous driving mechanism of sustainable consumption growth.

On the other hand, the service industry, especially the labor-intensive or human capital intensive service industry and the labor-intensive manufacturing industry, has caused a tide of shutdown and closure under the major impact of the COVID-19 epidemic, which may bring a large-scale unemployment risk and further weaken China's consumption growth driving mechanism [9]. However, in contrast, the COVID-19 epidemic is particularly detrimental to the US consumer economy. First, many American workers do not have paid sick leave, and millions of Americans do not have medical insurance. They are unlikely to stay at home and do not work or get proper medical care. Second, there are also fundamental differences in the economic structure of the two countries. The impact of the COVID-19 epidemic on the United States is even more serious. When the COVID-19 epidemic caused mass fear to the residents and led to social disconnection, China's service industries such as tourism, catering and retailing suffered relatively little negative impact due to the relatively developed online trading, online retail, online payment and online office compared with the United States. The manufacturing sector suffered relatively less negative impact than the service industry, and its recovery capacity was relatively stronger.

From the perspective of investment: in the early stage, under the influence of many uncertain factors, such as the uncertain time of resumption of work and production, the different time of unsealing in various places, and whether the employees need accounting, testing and isolation when they go out, the smooth progress of industrial production activities cannot be guaranteed, so the investment is correspondingly reduced; Secondly, under the epidemic blockade measures [3], the transportation industry and the express logistics industry are nearly paralyzed, which has brought huge obstacles to the production and processing of the manufacturing industry chain, and caused a reduction in investment due to the obstruction of the production and processing chain; At the same time, in the short term, the residents' consumption intention decreases, and the consumption of non-necessities decreases, which makes the investment in manufacturing enterprises correspondingly reduced. Based on Chinese and United States experience, the biggest concern for entrepreneurs and investors is the uncertainty of the future. The increase in uncertainty will hurt their confidence in U. S. commercial activities, which will directly cause the economy to fall. The outbreak of COVID-19 has added to the uncertainty and has had a negative impact on business confidence.

From the perspective of import and export trade, the impact of the epidemic on China's net exports is obviously greater. On 30 January 2020, the new coronavirus outbreak was designated as "PHEIC" of international concern [6]. The World Health Organization, meanwhile, said it would not recommend any country to impose trade or travel restrictions on the region. However, despite this, the lockdown measures adopted to contain the epidemic was finally happened [8]. And the epidemic actually caused China's domestic production companies to raise the price of product testing, which raised the relative price of export goods and decreased their ability to compete on global markets. As exports fell, so did overall demand, which led to a decline in the economy. Moreover, the subsequent global epidemic has led to a shortage of certain materials and a rise in prices. The relative decline of the import price and the increase in demand will lead to an increase in the import of foreign products, which will affect the domestic economy in some degree. In structural terms, industrial products account for the bulk of Chinese exports. As a result of the outbreak, the time for a substantial number of industrial companies to return to work and production has consistently been delayed. At the same time, the transportation and logistics industries related to exports have also been restricted. In addition, there are problems such as the backlog of goods in warehouses caused by the slow sales of goods under the epidemic, and the lack of transport time for the export quarantine work. Under the joint effect of these factors, the transaction costs of export enterprises have risen sharply while the production efficiency has been greatly reduced. From the perspective of importing countries, affected by the World Health Organization's definition of China's epidemic as an international health emergency, some countries control the export of China's specific commodities, which has a serious impact on the country's foreign trade, and the driving force of import and export trade to economic growth has been weakened.

## 4. Conclusions

In general, the impact of the epidemic on the economy of China and the United States is short-term, which is mainly reflected in the precipitous decline of GDP growth rate in the first quarter of 2020. The main reason for this impact is the weak demand caused by the epidemic prevention and control policies and people's pessimism, which is manifested in the insufficient consumption demand, investment demand and net export demand. From the comparison between China and the United States, the impact of the epidemic on the consumption demand of the United States is greater than that of China, mainly because the consumption in the economic structure of the United States is absolutely dominant, while the net export demand of the epidemic on China is greater than that of the United States. The main reason is that the processing industry still dominates in China's foreign trade structure. Therefore, the interruption of the supply chain caused by the epidemic has a certain impact on China's processing and manufacturing industry.

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