Inflation Measurement in China under the Coronavirus Pandemic

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Abstract. The consumer price index (CPI) and core consumer price index (core-CPI) are the main indicators reflecting the price level and inflation of a country or region. The two indicators and their transmission relationship are also widely concerned by the economic community. Theoretically, these two indexes will not fluctuate suddenly. However, in recent years, due to the uncertainty of the Corona Virus Disease 2019, the trends of both indicators have declined to vary degrees. This paper will start with the CPI, CORE-CPI, and inflation rate from 2017 to the present, and analyze the reasons behind their abnormal phenomenon. The results showed that the pork sales volume was the main reason for causing the fluctuations. Understanding the reasons for the decline will help China quickly formulate the most effective plan and help the inflation index to return to the right track. At the same time, it timely leads the country out of difficulties.

Keywords: Inflation rate, consumer price index, core-consumer price index, pork price.

1. Introduction

Around the Spring Festival in 2020, the Corona Virus Disease 2019 broke out in Wuhan, the ninth largest city in China and a major transportation hub in China, and quickly spread to the whole country. the Corona Virus Disease 2019 has been having the characteristics of a long latent time and strong infectivity, which has a huge negative impact on the Chinese economic development and people's lives. In order to avoid further expansion of the Corona Virus Disease 2019, local governments have taken strict measures such as home quarantine, extending the Spring Festival holiday, and delaying the commencement of enterprises. Wuhan and other places at the center of the Corona Virus Disease 2019 even took strict measures to "close the city". The outbreak of Corona Virus Disease 2019 has had a huge impact on the long-term and short-term development of China's economy. For China, the emergence of Corona Virus Disease 2019 is a "black swan" event. Before the Spring Festival in 2020, no one can predict the occurrence of this event, and certainly, no one can predict the huge impact it may have on China's economy.

For the microeconomic analysis, the measures taken to prevent and control the virus, such as restricting travel and closing stores, have changed people’s consumption habits, such as dining, traveling and shopping. However, people's spending on protective equipment has increased significantly. At the beginning of the outbreak, the amount of anti-epidemic goods in the market failed to meet the needs of residents. In general, the restrictions on residents' travel caused by the virus prevention and control have severely impacted the offline commodity trading market, but at the same time, it has promoted the development of the pharmaceutical industry and the reform of the market structure.

For the short-term macroeconomic analysis, the impact of the Corona Virus Disease 2019 has had a great impact on residents' consumption in terms of panic and income expectations. Smith (2006) believed that the characteristics of the new onset, infectivity and limited means of treatment of the sudden epidemic would cause sharp fluctuations in public sentiment, and consumer confidence and expectation are important channels for the macro-economic impact of the Corona Virus Disease 2019 [1, 2]. The panic and pessimistic expectations caused by the above characteristics of Corona Virus Disease 2019 reduced the consumption willingness of the residents in the short term and restrained the consumption demand of the domestic market. At the same time, people's pessimistic expectations of future employment and income caused by the epidemic situation have increased the output of preventive savings of households and further squeezed consumer spending. In the short term, the lack of consumer confidence has led to a large downward trend in the overall consumption scale of society. And the virus has caused great volatility in financial markets, which makes investors more cautious in choosing investments and reducing the scale of investments. The increase in market risk makes the credit audit of banks and other institutions more stringent, leading to more difficult financing for enterprises. During this special period, the Chinese government strictly controlled the flow of international personnel, the import and export of goods, while the reduction of domestic production scale led to a decrease in the export volume of Chinese enterprises.

In the long term, the epidemic will bring many changes to people's consumption habits and products. In terms of consumption habits, various traditional offline consumer markets have accelerated the online transformation. The integration of information and communication technologies represented by the Internet, big data, blockchain, 5G, etc. with various traditional industries, and various non-contact consumption methods have been widely studied and accepted by Chinese consumers. In terms of consumer content, people's demand for various non-contact economies has driven the growth of various online services. Online office, online entertainment, online education, online medical and other consumer fields have gained unprecedented attention and development. The technological innovation and transformation of the industrial chain continue to provide people with all kinds of new consumer products.

The inflation rate is one of the most important data to measure the economic index. The outbreak of COVID-19 has caused some economists to worry about high inflation rates, but the actual trend of inflation in the actual observation is not the same as the speculation. Also, accurately grasping the epidemic trend is the premise of economic analysis. According to the available public information, Dr. Zhang Wenhong, from the Infection Department of Huashan Hospital affiliated with Fudan University, made three kinds of judgments about the trend of the epidemic: (1) The prevention and control measures are appropriate, and the epidemic will be fully controlled within two months. (2) The severity of the epidemic exceeded expectations, and it took more than half a year and less than one year to fully control it. (3) The epidemic situation is completely out of control, causing a global pandemic. Academician Zhong Nanshan said in an interview with Reuters on February 11, 2020, that the new cases of new coronavirus pneumonia have declined in some regions, and the epidemic situation is expected to ease [3]. Based on the judgment of many epidemiologists, this paper will analyze the Chinese Consumer Price Index, Core-Consumer Price Index, and inflation rate in recent five years. Therefore, researching these three indicators under the virus can play a certain helpful role in the recovery of economic development.

2. Analysis Based on the Inflation Indicators

According to CEIC's official data, China's CPI index, inflation rate and core-CPI index all showed different downward trends during the peak period of the COVID-19 outbreak.

2.1. Consumer Price Index

Figure 1 shows the change in Consumer Price Index from 2017 to 2022. CPI is a macroeconomic index reflecting the changes in the price level of consumer goods and services generally purchased by households. It is a measure of the relative changes in the price level of a group of representative consumer goods and services over time in a specific period. It can be seen more intuitively that after 2020, that is after the outbreak of COVID-19, the CPI experienced a significant decline, from 101.8 in 2017 to 105.4 in 2019 and the 99.5 by 2020. The CPI growth rate decreased due to the decrease in consumption opportunities due to home isolation in 2020, but increased because of the recovery of consumption and compensatory consumption in 2021. therefore, the CPI growth rate was like the rate after the virus in the whole of 2021 [3].

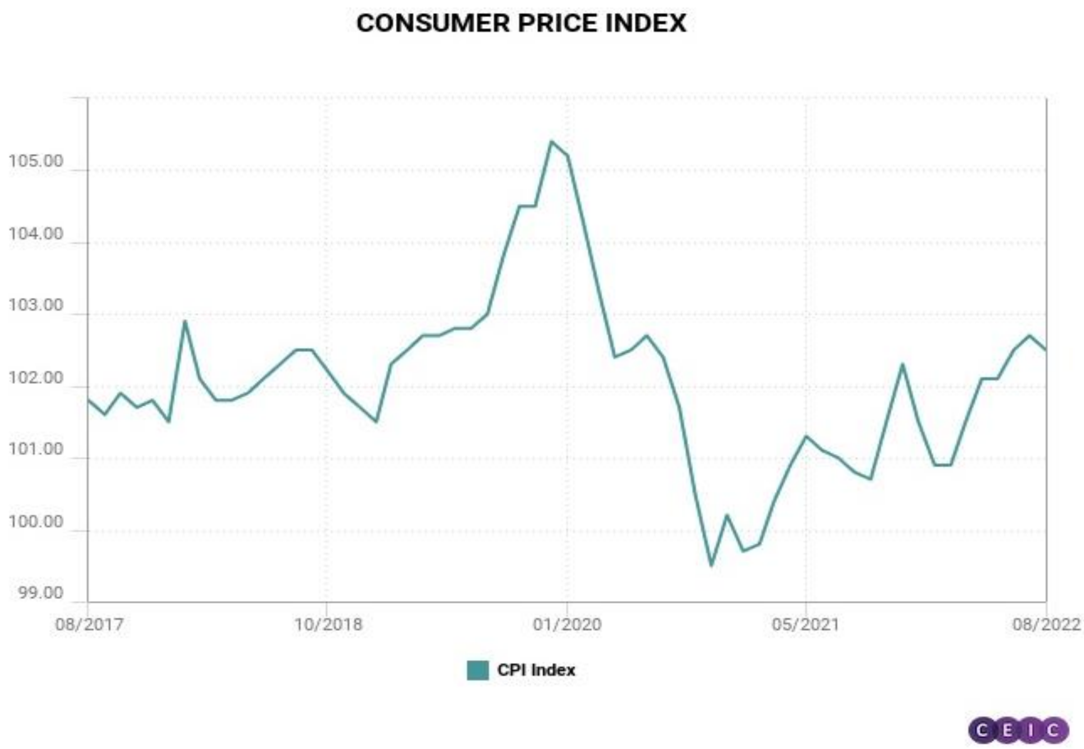

Figure 1. Chinese CPI in recent five years [4].

Chinese CPI consists of food and non-food items, with weights of about 30% and 70% respectively. Food items have a more significant impact on CPI than non-food items. So, the decline of food prices is the main reason and driving force for the downward trend of the Consumer Price Index. Because the composition of consumption basket depends on its own actual situation, the weight of food and beverage in the CPI of developed countries is obviously lower than the level of China. But in Chinese CPI, the weight of pork and other meat is higher, which is inseparable from the living habit of Chinese residents. So, pork prices almost dominate the CPI. First, due to the COVID-19, transportation restrictions and feed shortages may interrupt the normal supply of pork, resulting in a large amount of pork sitting in warehouses without channels to sell. As a result, there was a temporary spike in pork prices, but it will be followed by the releasing and the resumption of the catering industry, with vendors choosing to sell their pork in one go. This can lead to a sudden increase in the amount of pork on the market without a rise in demand, leading to lower prices. Second, because of the impact of the COVID-19 epidemic in some areas, there have been many cases where people go out to eat together and are pulled to centralized isolation. This will greatly reduce people's enthusiasm for eating together, and pork consumption is bound to be affected.

In addition to pork prices, the decline in CPI is also due to the decline of residents' consumption expenditure are the reduction of residents' income and lack of consumer confidence under the impact of the epidemic. Because of the COVID-19, some small and medium-sized enterprises have been unable to sustain themselves and chosen to close-down. As a result, the unemployment rate increased significantly, and the overall growth rate of residents' income was relatively slow, which was still far from that before the virus. And people who have not lost their jobs will choose to put a large part of their salary into the bank as a precaution. This means that: on the one hand, the trend of per capita consumption expenditure and disposable income of residents is falling and recovering at the same time, indicating that the decline of residents' income under the impact of the epidemic is an important reason for the decline of consumption expenditure; On the other hand, the recovery of per capita consumption expenditure is significantly lower than that of per capita disposable income, indicating that the impact of the epidemic has increased residents' concerns about future uncertainty, resulting in insufficient consumer confidence and enhanced savings motivation. After the end of the subsequent isolation requirements, the residents did not make compensatory and retaliatory consumption [5]. Therefore, the slow growth of income limits people’s daily expenses, making people's desire to consume less. According to the official data of the National Bureau of Statistics of China, the cumulative year-on-year growth rate of total retail sales of consumer goods reached a historic low of -20.5% in February 2020. Since the total retail sales of social consumer goods in the first half of 2020, that is, during the epidemic, shrank significantly, and the rebound intensity of residents' consumption in the second half of the year was not enough, the total retail sales of social consumer goods in 2020 was lower than that in 2019, and there was no so-called rebound, which had a drag effect on economic growth. This is the reason for the sharp decline of CPI.

2.2. Core-Consumer Price Index

Figure 2 shows how the Core-Consumer Price Index (Core-CPI) changed from 2017 to 2022. The Core-CPI was proposed by the American economist Gordon in 1975. It is a residential price index excluding the product prices that are greatly influenced by climate and seasonal factors. The idea is that temporary increases in the price of goods for supply reasons do not represent a long-term trend of rising prices. In order to accurately judge the long-term trend of price increases, the effect of much larger changes in the food and energy components of consumer prices than in other components should be deducted [6, 7]. As can be clearly seen from Figure 2, the index has been in a declining state throughout the whole 2020. Until 2021 it took to gradually return to pre-virus levels.

Figure 2. Chinese core-CPI in recent five years [8].

China uses the elimination method as the measurement method of Core-Consumer Price Index. By specifically analyzing the historical data of Chinese price changes, select the items that are eliminated according to the actual situation, fully consider the impact of food, energy and capital interest rates on the consumer price index, and compile the consumer price index that excludes items that cannot be controlled by the central bank, such as food and primary energy, as the Core-Consumer Price Index of China. After deducting energy and food, the "core CPI" continued to decline during the epidemic. It further confirms the above judgment on insufficient effective macroeconomic demand and negative output gap. It also can be seen from the figure 2 that the core CPI hit a record low in December 2020, which indicates that the actual demand of residents is still weak under the influence of repeated epidemics and cold waves. To sum up, there are several reasons for the decline of Core-CPI. First, it has something to do with the recent multi-site spread of the epidemic, which has led to the slow growth of the contact service industry, such as the continuous negative growth of the transportation sector and the low growth of the education, culture and entertainment sector; Second, it is related to the slowing down of residents' income growth under the impact of the epidemic, such as the continuous negative growth of residential and clothing prices; Third, it is also related to the high growth rate of service projects in 2019, which is not conducive to the improvement of year-on-year growth rate in 2020 technically.

2.3. Inflation Rate

As shown in Figure 3, from 2016 to 2021, China's inflation rate (last year =100) was respectively 102, 101.56, 102.1, 102.9, 102.5 and 100.9. It can be seen that China's inflation rate has decreased to a small extent since the outbreak of the COVID-19 in 2020.

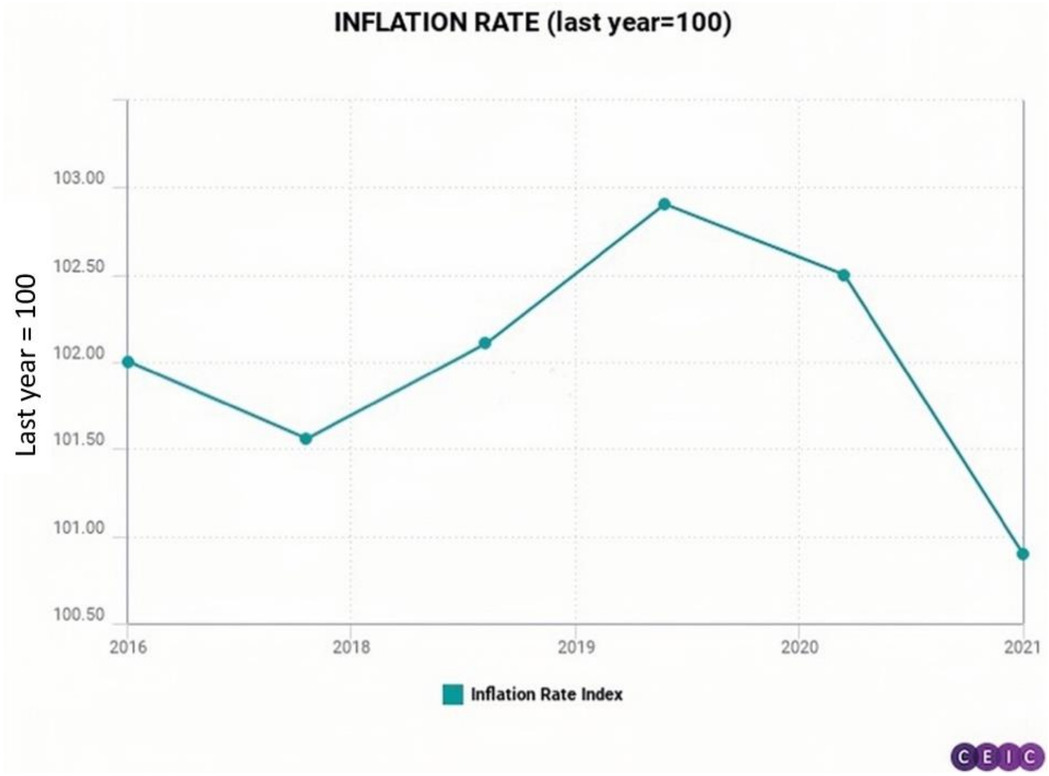

Figure 3. Chinese inflation rate in recent five years [9].

According to the reduction of CPI and core-CPI mentioned above, the reduction of inflation rate is obvious. From the data of various countries during the epidemic period in history, including the SARS in China in 2003, it is confirmed that after the epidemic, the downward trend of inflation is almost universal. From the perspective of the duration of the epidemic and the number of deaths, the more serious the epidemic, the more obvious the impact on inflation. The possible reasons for this result: First, the uncertainty after the epidemic increased the precautionary savings of the people, while the demand for investment declined. Second, the "belief scar" formed by the epidemic will continue to shape people's perception of extreme negative impacts. The third is the resource mismatch caused by various nominal and real frictions in the economy. In the "post epidemic era", productivity may still be low, thus driving down the potential output and inflation trend. However, compared with the epidemics experienced by some European countries, this new epidemic is still different from others. First, after this epidemic, the financial and monetary authorities have carried out unprecedented policy assistance. The large-scale stimulus around the world has avoided the bank bankruptcy or large-scale unemployment, and the loose monetary policy has avoided the credit tightening and liquidity shortage, which are conducive to driving up inflation. Government adhered to the system theory, implement macro policies in accordance with the macro governance framework with Chinese characteristics, comprehensively solve cyclical and structural problems, and achieved the organic unity of growth momentum and volatility management, cross cycle and counter cycle policies [10]. Secondly, vaccination has reduced the number of closed cities, which is conducive to increasing consumption and promoting economic development. Third, although some retail stores and factories are closed, other industries can mitigate the impact of the epidemic through home office. Fourth, the disorder caused by the epidemic and the increase in transportation costs are passed on to consumers, which also makes some goods' prices rise.

3. Conclusion

In conclusion, as a special period in China, the COVID-19 will certainly have an impact on the economy. The factors that influence inflation include both exogenous and endogenous factors, short-term fluctuations and cyclical adjustment. On the one hand, the CPI dropped significantly due to the price reduction of pork, and on the other hand, the overall economic situation was sluggish, which led to the reduction of people's consumption desire. The decline of Core-CPI can also confirm this, because most of the index is calculated from food and energy. It can be seen from the figures that the slope of Core-CPI decline is higher than that of CPI. The last is the inflation rate. There is no doubt that it is the most intuitive to see the inflation situation in China. According to this situation, China can make corresponding adjustments to production development, public services, education system, etc., reduce unnecessary labor costs and promote the transformation and reform of intelligent production and lifestyle. Secondly, attach great importance to the transmission mechanism of fiscal and monetary policies during the epidemic, and improve the currency circulation. Also, actively solve the problem of a large number of unemployed people and the problem of food and clothing caused by lower income. Finally, under the guidance of the new development pattern, the government needs to further promote structural reform and adjustment, and fully release the potential growth space of China's economy by building new dividends and solving structural problems.

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