

The Impact of COVID-19 on Stock Market and China's Economy

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ABSTRACT

Under the background of the COVID-19 pandemic, China's economy has been impacted to a certain extent. With the promulgation of the shutdown policy, domestic consumption and production have stagnated, and the stock index fell to a great extent in the first and second quarters. This study evaluated the impact using the OLS regression method to analyze the relationship between the daily newly confirmed number of COVID-19 in China and the stock index and stock turnover. GDP and consumer confidence indicator (CCI) are also the observation objects of this research. By studying the changes in production, consumption, and investment during the epidemic, this paper explains the epidemic's impact on China's stock market and economy. The result shows covid-19 greatly impacts the production capacity of enterprises and the consumption expectation of residents, resulting in a significant decline in GDP and CCI, leading to the downturn of the economy. The epidemic also has a great impact on the stock market. The stock index will fall every time a new epidemic breaks out, and there is a significant correlation between them. The Chinese government has issued an epic prevention and control policy that forces enterprises to suspend their production and many other business activities. This affected the enterprise's production capacity, made its share price fall, and plunged the stock market into a downturn. However, during the epidemic period, the stock market's trading volume increased significantly due to the reduction of consumption and the instability of enterprise operations.

Keywords: COVID-19, Consumer Confidence Index, stock market, China's economy

1. INTRODUCTION

1.1. Background

In December 2019, Patients with inexplicable pneumonia occurred one after the other in several medical facilities in Wuhan and Covid-19 was found for the first time in China. On January 23, 2020, the Wuhan administration stated that the airport and train station would be temporarily blocked to anybody leaving and entering Wuhan. The entire city would be placed under lockdown. The number of coronavirus patients increased and expanded throughout China, accidentally spreading to the rest of the globe. The number of newly confirmed patients every day peaked on February 15, reaching over 15000, and by the end of February 2020, China had 79968 confirmed patients.

To minimize widespread movement and gathering of the populace, measures such as house quarantine and

longer Spring Festival holidays were used for prevention and control. People in nearly every area of China faced various degrees of travel restrictions or social distancing regulations. People are unable to work, and many commercial operations have been forced to halt. COVID-19 restrictions have had a significant impact on people's lives and China's economy. Demand and output fall precipitously, as do investment, consumption, and exports. Because of a lack of industrial activity, supply declines considerably, causing a short-term price increase. As a result, the laws of self-isolation and forbidding mass assembly considerably diminish consumer demand. Catering, tourism, movies, transportation, and education are among the worst impacted industries. Private firms, small and micro businesses have begun to lay off workers, increasing short-term unemployment, with employees in flexible payment systems and migrants bearing the brunt of the burden. The epidemic has also had a significant impact on the Chinese stock market and the global economy. The

financial market is rife with speculations, panic, and confusion in the aftermath of the coronavirus, resulting in significant swings in stock prices.

1.2. related research

Many studies researched the impact of COVID-19 on the Chinese economy regarding the macroeconomy in China. He et al. studied China, which is in the rapid development stage of the epidemic, as one of the countries in the early stage of the epidemic, the impact of the epidemic on the macro economy, and the specific performance of the macro economy. He et al. described the impact of COVID-19 on the economy in China and the US's economy and provided correlation analysis and comparison of China's economic impacts with the United States. He et al. believe that the following views are worth referring to: Currently, the economic impact of COVID-19 on the United States is far superior to that of China. The economy during the epidemic period is strongly linked to confidence factors, which certain confidence indices can measure. In addition, this relationship with the national economy appears to explain the effects that previous research has attributed to non-emotional factors [1]. Zhao introduced the Susceptible-Infectious-Recovered model into the Bewley-type-incomplete market model and used it to investigate the impact of the coronavirus pandemic (COVID-19) on the Chinese macroeconomic. Research has first analysed how COVID-19 interacts with diverse health risks and affects economic activity. Zhao found that household health risks have a significant quantitative impact on financial demand. The study results show that as more and more people are infected, the average propensity to consume household wealth will drop significantly, while the total demand for money will increase. The COVID-19 pandemic has reduced the health of infected families, and families have increased their cash reserves to mitigate these health risks [2]. Khan et al. reviewed 15 articles to see the epidemiology of the coronavirus in the world and its effects on the Chinese economy. The research found that China export and import have been declined, which have highly affected the world's economic growth while China's economy was severely affected. The social and economic system has been locked where no one goes outside the country or comes inside, so the China economy has been highly affected. Economic growth has been declined to 2 per cent while it will also be more affected [3]. Liu researched China and examined a series of issues, including the impact of COVID-19 on the Chinese economy, China's policy response to this shock, such as fiscal, monetary, and institutional measures, as well as the impact, such as the nature, costs, and benefits of China's policy response. The research also explores questions that need to be answered in the future. Given China's importance in the size of the world economy, its contribution to world growth, and its increasing influence [4].

Besides investigating the effect of coronavirus on the macroeconomy in China, some studies analyze how the pandemic influence different sectors and industries. Fernandes et al. used the complexity-entropy design methodology to assess the impact of the new coronavirus (COVID-19) crisis on Chinese sector indexes. Research results suggest that the crisis has led to an increase in inefficiencies in China's economic sectors. This effect depends on the economic sector analysed, suggesting that the effects of the crisis depend on the sector and are not perceived homogeneously. However, the crisis's impacts are not homogeneous across sectors, which indicates that large global shocks change stock markets' dynamics. Diversification plays an essential role in absorbing such shocks and reducing systemic risks [5]. Dhar et al. researched the impact of COVID-19 on Chinese businesses and industries. Research has revealed that COVID-19 has a dramatic impact on Chinese businesses and industries through the analysis of the GDP of China, the balance of trade and the Shanghai Stock Exchange Composite Index. Dhar et al. illustrated that since the beginning of 2020, the Chinese economy suffered because of coronavirus's adverse impact. However, Dhar et al. also suggest that from China's performance of dealing with SARS, this country should overcome the pandemic in a short amount of time. [6]. Zhang et al. assess the potential economic cost of the COVID-19 pandemic on China's macroeconomy and agri-food system and provide policy recommendations to stimulate economic growth and agri-food system development. The impact of COVID-19 on China's macroeconomy and agri-food system is assessed using an economy-wide multisector multiplier model based on China's most current social accounting matrix (SAM) for 2017 with 149 economic sectors. The supply chain links are the subject of SAM multiplier analysis, which captures the intricacy of a linked economy. COVID-19 has a substantial impact on both the economic system and the farming sectors. GDP fell in the early 2020s due to COVID-19, compared to the corresponding time in 2019, with COVID-19 affecting immigrant labor more than the skilled workforce. Even though the nation's economy began to recover in the second quarter and is projected to return to normal in the fourth, overseas demand remains unclear because of the worldwide pandemic [7]. COVID-19 has an impact on major sectors as well as production and transportation systems. According to Vasiev et al., the article analyzed several scenarios for variations in Chinese provinces' consumption and production during the COVID-19 pandemic using geographical data, migration index indicators, and statistics about the pandemic. The model is based on financial and migratory movements between Chinese provinces, and it was calculated for 31 provinces and 42 sectors of the Chinese economy. The study's major advice is that consumers do not need to be separated. It is important to divide the harm across all provinces as evenly as possible. Such a strategy will allow China's economy to sustain the least amount

of damage feasible while also allowing for a speedier recovery. The report also looks at how bilateral post-epidemic financial flows between China and Russia are developing through 2025. A transitory decrease is predicted in all circumstances [8].

Many papers research the stock market in China or use the stock market data, particularly to study the effect of Covid-19 on the economy. Yang et al. researched the two-dimension variations of stock volatility under the impact of the COVID-19 pandemic and two types of EPU: measured by comprehensive newspapers news and financial newspapers news. Yang et al. adopted a multi-period DID approach, document novel two-dimension variations of stock volatility under the impact of the COVID-19 pandemic and EPU in the Chinese stock markets. The research results prove a significant additional increase in the volatility of stocks with a higher degree of sensitivity to EPU after the announcement of the COVID-19 pandemic lockdown. Secondly, subsample analyses on firm characteristics confirm that the two-dimension effect of COVID-19 pandemic and EPU is most pronounced for consumer, less-profitable, and high leverage stocks [9]. Wang et al. used a sample of Chinese firms, examined stock market reaction to firms that changed their product lines to those related to the management of COVID-19. Research conducted an event study on the announcements of product line transformation using a sample of Chinese firms during the COVID-19 pandemic. It examined the impact of foreign sales on the cumulative announcement returns (CARs) related to the product line transformation. Wang et al. found the stock market positively views able corporate leaders who can leverage a public health crisis and the notion that investors believe a firm will be successful if it can adapt to the new demand for pandemic-related products [10]. Yan looked into how Chinese financial markets reacted to the COVID-19 outbreak during a fifty-day period, from the first and the early second quarter of 2020. The findings demonstrate that the coronavirus causes large price swings in stocks. Stock prices plummet in tandem with Wuhan's shutdown, but the research indicates that stock returns invert every 10 days of trading during window time. Overreaction, regulatory responses, and the contemporary economy's interconnectivity through global supply chains may all play a role in the frequent reversals. The size of the firms, on the other hand, is a significant component in preventing return reversals. Yan also discovered that non-SOEs, businesses with larger concentrated ownership, and non-pilot equities margin trading firms suffer more as a result of the coronavirus epidemic. On the other hand, these observations do not exist for the SARS pandemic in China between 2002 and 2003. This research adds to the body of knowledge about the influence of outbreaks of infectious diseases on stock markets. [11]. The possible impacts of COVID-19 on the Chinese economy were investigated by Okyere et al. The

study demonstrated and analyzed the influence of COVID on the Chinese stock market using data from the Dow Jones, Nikkei, FTSE, and Shanghai Stock Index. The study also discussed the positive externalities of COVID on Chinese China's economy, including chances to explore new technologies, reduced asymmetric information, and government interventions like grants, exemptions, and transfer payments [12].

1.3. Objective

The main objective of this paper is to find out the impact of COVID-19 on the stock market and China's economy. Regression is used to identify the possible correlations and causal relationships (if any) and examine the severity of the pandemic and stock market indexes of the Shanghai Stock Exchange, Shenzhen Stock Exchange etc., to investigate the effect of COVID-19 on the Chinese stock market. The paper analyses data such as GDP and CCI to figure out the broad effect of COVID-19 on China's economy. The paper analyses data such as GDP and CCI to figure out the broad effect of COVID-19 on China's economy and combine the macroeconomic data and stock indexes to explain the reasons why the pandemic can cause such effects and give suggestions.

2. METHOD

The impact of the new epidemic on the financial market is mainly reflected in the impact on the stock market, bond market and foreign exchange market. In this paper, we mainly study the impact of COVID-19 on the stock market and the Chinese economy.

This article mainly uses the close index, trading volume, and lowest index of the Shanghai Stock Exchange, Shenzhen Stock Exchange, and Growth Enterprise Market to perform OLS regression with the daily number of confirmed cases of the new crown epidemic. The impact of COVID-19 on the Chinese economy from the regression results is analyzed. The data used in this article are the close index, trading volume, and lowest index of the Shanghai Stock Exchange, Shenzhen Stock Exchange, and ChiNext on each stock trading day since January 16, 2021. And the number of new domestic confirmed cases counted by China on each trading day. The stock market data was extracted using the DateYes website. The number of newly diagnosed people directly used the daily COVID-19 data released by China's National Bureau of Statistics. We used the data of 330 trading days from January 16, 2020, to May 31, 2021. In June 2021, the Delta variant of Covid-19 began to spread in China. Therefore, the new round of the epidemic will have a certain impact on the future Chinese economy. However, due to incomplete data, we are not against The Delta variant of Covid-19. 19 Data after being introduced to China for research. We use the Min-max normalization method to standardize the

data so that some very large values can be better used in the regression equation.

During the SARS period in 2003, the Shanghai Composite Index rose cyclically, and the trading volume in April 2003 also rose sharply. After SARS, the Shanghai Composite Index declined gradually and rose slowly at the end of the year. During the outbreak of the new crown epidemic, the stock market's performance before the Chinese New Year 2020 was not significantly affected by the epidemic. However, during the Spring Festival, the policy of corporate closure was introduced, which directly caused the stock market to plummet on the first trading day after the Spring Festival. At the same time, we also refer to GDP and consumer confidence indicator (CCI), which can reflect the changes in production and consumer consumption expectations during the epidemic and explain the epidemic's impact on consumption and production.

3. RESULTS

The Consumer Confidence Index (CCI) indicates the future development of household consumption and

savings based on responses to households' expected financial status, perceptions of overall economic conditions, unemployment rate, and saving capacity [13].

From 2016 to 2019, China's CCI showed a steady upward trend, from 104% in January 2016 to 126.6% in December 2019. Looking back at the SARS epidemic in 2003, the average CCI in the first quarter was 114%, and then the SARS epidemic broke out. The average CCI in the second and third quarters was only 102.3% and 107.7%, and in December 2003 only recovered to 111.2% [1]. In summary, the consumer satisfaction index and CCI declined significantly in the first and second quarters of 2020, at a rate of about 10%. Among them, the CCI in July 2020 was 112.6%, the lowest value since 2017. At the end of the third quarter, CCI gradually rose, returning to its average value in November 2020. But in the second quarter of 2021, due to the outbreak of the epidemic again, China's CCI dropped, with a decrease rate of about 5%.

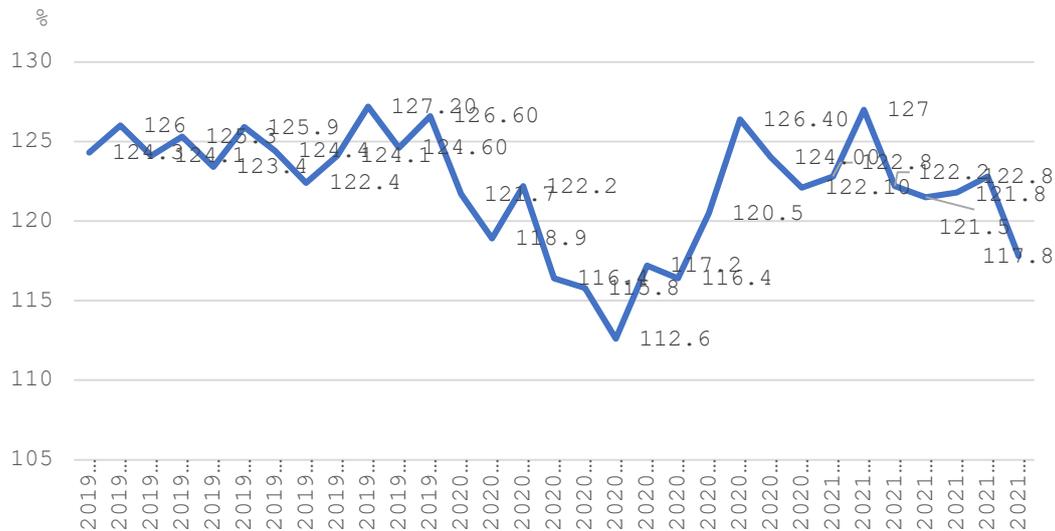


Figure 1. 2019-2021 China monthly CCI index

Table 1 shows the OLS regression results between the number of newly diagnosed daily and turnover of Shanghai Stock Exchange, Shenzhen Stock Exchange and ChiNext, respectively. There is a significant positive correlation between the number of newly diagnosed daily and the trading volume of China's stock market. The coefficients of the patient were 0.0781, 0.498 and 0.288, respectively. This means that the spread of the epidemic will increase the trading volume of stocks.

Table 1. Regression results of turnover and patient

Turnover	Turnover	Turnover
Shang	Shen	ChiNext

patient	0.0781 (0.95)	0.498*** (5.00)	0.288*** (3.41)
-cons	0.277*** (29.45)	0.311*** (26.66)	0.266*** (26.88)
N	329	329	329

t statistics in parentheses

*p<0.05, **p<0.01, ***p<0.001

Table 2 and Table 3 shows the OLS regression results between the daily newly diagnosed number of COVID-19 and the closing index and low index of Shanghai Stock Exchange, Shenzhen Stock Exchange and ChiNext,

respectively. Contrary to the trading volume, there is a significant negative correlation between the closing index and the low index of China's stock market. This means that as the number of patients increases, the stock index will decrease.

Table 2. Regression results of closing index and patient

	Closing Index Shang	Closing Index Shen	Closing Index ChiNext
patient	-0.507*** (-4.11)	-0.494*** (-4.15)	-0.539*** (-4.40)
-cons	0.578*** (39.97)	0.505*** (36.11)	-0.541*** (37.72)
N	329	329	329

t statistics in parentheses

*p<0.05, **p<0.01, ***p<0.001

Table 3. Regression results of lowest index and patient

	Lowest Index Shang	Lowest Index Shen	Lowest Index ChiNext
patient	-0.540*** (-4.34)	-0.522*** (-4.32)	-0.568*** (-4.59)
-cons	0.578*** (39.58)	0.517*** (36.49)	0.550*** (37.92)
N	329	329	329

t statistics in parentheses

*p<0.05, **p<0.01, ***p<0.001

4. DISCUSSION

In 2020, China's GDP (Gross Domestic Product) had been severely affected by the COVID-19 pandemic. Overall, GDP suffered a great decline and slightly recovered at the end of the year; In the first and second quarters, GDP decreased by 6.8% and 1.6% year-on-year respectively, and it increased by 0.7% and 2.3% year-on-year respectively in the third and fourth quarter. Although the pandemic became less severe at the end of the year, there is still a big gap compared with the economic growth rate of about 6% year-on-year in 2019. From the first quarter of 2020, the epidemic broke out in China in an all-round way, and the number of newly diagnosed patients per day in February was very large. The Chinese government imposed the national lockdown and policies to suspended business activities and suggested people stay at home since February, which greatly impacted residents' consumption and international trade. Also, the CCI (Consumer Confidence Index) dropped significantly from 127.20 to 112.6 from January to July in 2020, which indicated a huge fall in people's consumption and explained the negative growth of GDP in the first two quarters of 2020. The national lockdown and the travel restrictions end at the end of the second quarter, so this may be the reason why economics starts to recover in the third quarter. Compared with the previous year, the GDP growth rate in 2020 has a big decline, which means that COVID-19 has a more profound impact on China's economic growth.

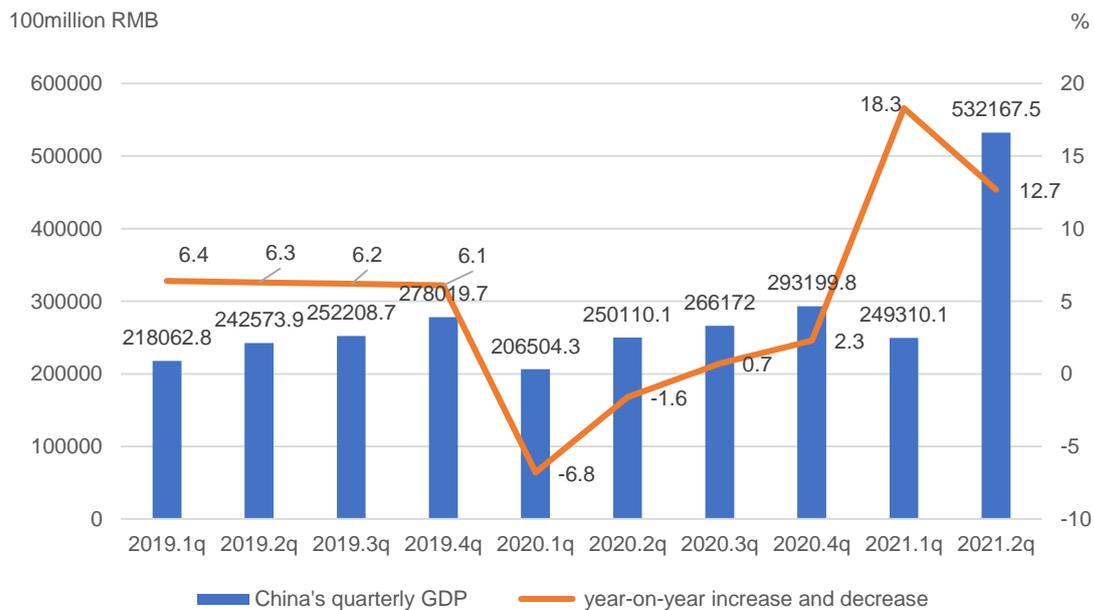


Figure 2. 2019-2021 China's quarterly GDP and year-on-year increase and decrease

The outbreak of COVID-19 in 2020 caused a downturn in the stock market, which the stock market indexes could reflect. The increase of daily new patients has a significant negative correlation with the daily lowest index and daily closing index. According to the result of OLS, a unit of increase in newly diagnosed patients led to 0.540, 0.522 and 0.568 unit decrease in the lowest index of Shanghai Stock Exchange, Shenzhen Stock Exchange and ChiNext, respectively; a unit of increase in newly diagnosed patient led to 0.507, 0.494 and 0.539 unit decrease in the daily closing index of Shanghai Stock Exchange, Shenzhen Stock Exchange and ChiNext respectively. Due to the outbreak of COVID-19, following the Emergency Response Law and Law on Prevention and Treatment of Infectious Diseases, the Chinese government has issued an epidemic prevention and control policy such as the national lockdown and advice for residents' self-isolation, which forces enterprises to suspend their production and many other business activities. These policies have hindered the production of enterprises, so some companies and factories started to lay off workers, and the income of employees has also decreased significantly due to the impact of the shutdown. Due to the reduction of production and profitability of enterprises, the company's stock price will fall, resulting in the decline of the overall index of the stock market. This shows that the outbreak of COVID-19 has affected the operation of enterprises, thus affecting the stock market index and causing the stock market to fall into a downturn.

As shown in Table 2, the stock market trading volume is positively related to the number of new arrivals per day of COVID-19. According to the result of OLS, a unit of increase in newly diagnosed patients led to 0.0781, 0.498 and 0.288 unit increase in the turnover of Shanghai Stock Exchange, Shenzhen Stock Exchange and ChiNext, respectively. This indicates that during the outbreak, some of these capital flows to the stock market, bond market and foreign exchange market and other financial markets during the outbreak. There are two possible reasons for this change. Firstly, the rise of stock trading volume is related to the instability of business during COVID-19. The implementation of various subsidy policies, such as less individual income tax and Corporate income tax, and the stagnation of business production have greatly affected the profitability of enterprises and then affected the stock price of enterprises and even industries. The instability of stock prices has also become one of the reasons for the relatively large fluctuations in the stock market's trading volume during the epidemic. Unable to correctly estimate the direction of the enterprise, investors need to buy and sell more frequently. In addition, to avoid the risk of cross infection, the implementation of policies for maintaining social distance and prevent crowd gathering led to the shutdown of business in crowded places, such as shopping malls, cinemas and gymnasiums. The reduction

of income and the inability to participate in collective entertainment activities have reduced living and entertainment expenses, resulting in the overall decline of China's national consumption. As explained in the result, due to the epidemic's impact, the decrease of China's CCI indicates the decline of China's national consumption desire. The decrease in consumption may lead to more savings, and more savings may increase the desire for investment, so people may buy more stock and sell more simultaneously. This reflects the outbreak of COVID-19, which has a relatively important impact on stock market capital inflow and transaction volume increase.

5. CONCLUSION

The paper uses OLS regression methods to examine the relationship between daily newly diagnosed patients, stock market indexes, and trading volume. By analyzing the change of macroeconomic data such as GDP and CCI, and studying Chinese people's production, consumption and investment behaviors, the paper finds out the COVID-19 has a great downturn effect on China's economy in the first and second quarter of 2020 and strike the stock market at the same time. GDP and CCI both fall significantly from January to June in 2020 and recover slightly in the latter half of the year. The stock market indexes, daily closing index and daily lowest indexes are both negatively correlated to the number of daily newly diagnosed patients, which means the worse the pandemic, the worse the stock market will perform. One interesting finding of this paper is that the stock's trading volume is positively correlated to several newly diagnosed patients, which the instability of stock price could explain, and people buy and sell stocks more frequently because of the fluctuating price.

Overall, this paper illustrates the negative impact of COVID-19 on China's stock market and the whole economy. Although the economy may self-recover slightly after the end of the national lockdown, the government still needs to offer subsidies and issue new policies. For example, on the supply side, providing subsidies and changing tax policies to help enterprises to survive and encourage business' production activities. On the demand side, the government can increase investment to boost the growth of GDP and mitigate or remove some social distancing policies to encourage consumption.

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