

# Analysis of Stock Markets and Investors during COVID-19

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## ABSTRACT

There is no denying that the pandemic of COVID-19 is a significant event that happened at the end of 2019. It brought about great changes in the world and caused some turbulence. As a result of temporary policies and sudden changes brought by China's government, trading and some types of business have been influenced by these pieces of information inevitably. In this case, stock markets and investors in China were influenced. This paper will use the literature research method to learn about the changes that happened in China's stock market and find the following conclusion: driven by information, different people who played different roles would take different actions during COVID-19, which made fluctuations in stock markets. The author advises that the government and market regulators need to take timely actions, optimize information conveying ways, and promote multilateral cooperation. For investors, the author thinks they need to learn more about the stock market.

**Keywords:** Stock Market, Information, COVID-19, Investors

## 1. INTRODUCTION

In 2019 and 2020, COVID-19 gave most countries in the world an almost refreshed system in different areas, such as international trade, economics, and education. It brought about great changes in the world and caused some turbulence. In China, at the beginning of the outbreak of COVID-19, China's government had taken a series of immediate measures to prevent the deterioration and spread of the epidemic, such as shutting down cities. China, even most countries in the world, has not been faced with such a serious situation for more than 10 years. Some people said the severity of the COVID-19 epidemic was similar to that of SARS.

This paper will summarize some phenomena that happened in the Chinese stock market and investors during the pandemic of Covid-19 in the first part. The first part will compare some data describing the background and situation of COVID-19 and analyze the differences between the pandemic of SARS and COVID-19. These summaries can make changes during COVID-19 visualized and give more people a clear and visual perspective of the Chinese stock market's volatility

during the pandemic. The author collects related information from other previous articles published by Chinese scholars and government agencies. And then the second part will show the analysis results of the reasons for these happened phenomena and why these reasons would come out. Last but not least, in the third part, the author will give some suggestions to the Chinese government, market regulators, and investors according to the above reasons. These suggestions can not only help more regulators learn how to stabilize markets but also help investors how to make investments more promising and avoid being cheated.

## 2. ANALYSIS OF CHINA'S STOCK MARKETS DURING COVID-19

### 2.1. Fewer fluctuations during COVID-19 compared with that during SARS

When it comes to the stages of the Chinese stock market, the author uses the following table to find the facts of the stock market before and during the pandemics of SARS and COVID-19.

**Table 1.** The fluctuation of China's stock market during SARS and COVID-19 [1]

	The period of SARS	The new normal period after SARS	The new normal period before COVID-19	The period of COVID-19
ARCH	0.3062***	0.0567***	0.1143***	0.2368***
SD	[0.0747]	[0.013]	[0.0247]	[0.0556]

First, as the table shows, the results of the standard deviation shown in the table are greater than zero. And the standard deviation can reflect the degree of separation from the mean of a group of data. Compared with the number of results before COVID-19 (0.0247), the standard deviation during the period of COVID-19 has increased slightly (0.0556). In other words, a greater degree of dispersion happened in the data set collected during the period of COVID-19. This shows that the Chinese stock market during COVID-19 would be disturbed by its early ups and downs, but the influence was not significant. In addition, the standard deviation during COVID-19 was less than the results shown during SARS. This proves that the Chinese stock market during COVID-19 was less volatile than that during SARS.

**2.2. Downward return in whole China’s stock market**

Although the fluctuation was not significant, the general trend of China’s stock market during the pandemic was downward. Table 2 shows that the Chinese stock market (SSEC) is represented by SCR. The mean shows the average level of return in China’s stock market. The negative number means the returns for investors didn’t increase investors’ wealth. The skewness of stock market returns is negative. Negative skewness suggested that most of people suffered a loss during COVID-19. In other words, there is a high probability for investors to get an unsatisfying return if they make an investment during COVID-19.

**Table 2.** Downward trend of China’s stock market [2]

	SCR
Mean	-0.147617
Skewness	-1.558152

**2.3. The apparent fluctuations of stocks in medical fields**

Although it could be learned from the above table that the standard deviation was not changed significantly, it just describes the overall China’s stock market without a detailed analysis of the market of China's internal industries. However, the effects of medical portfolios in China are significant because of the urgent need for medical products. Millions of people were put at risk by unexpected diseases, and thousands died as a result. This situation makes the demand for medical supplies increase sharply, so that some industries related to medical support need more cash flows and operate normally. However, some businesses that would need clusters of people, such as restaurants, need to be suspended. The imbalance of demand resulted in the volatility of China’s stock markets.

In the outbreak of COVID-19, the demands for various medical devices, chemical tablets, vaccines, and so on were increased sharply to stabilize the situation. In this case, those medical companies should require more cash flows so that they can support their research, development, and production. The author found a significant fluctuation in the medical stock market and more return investors got at the beginning of 2020 through Figure 1 below.

The vertical axis represents the rate of abnormal returns, which is the difference between the actual return of the medical portfolio compared with investors’ expectations. And the horizon axis represents the dates before and during COVID-19. And 10 days between every adjacent number shown in the horizon axis. In the figure, it’s obvious that abnormal returns in China's medical stock market increased rapidly while it was stable before COVID-19. So the conclusion we can get is that after the outbreak of COVID-19, the return of medical portfolio was increasing sharply compared with before the outbreak.

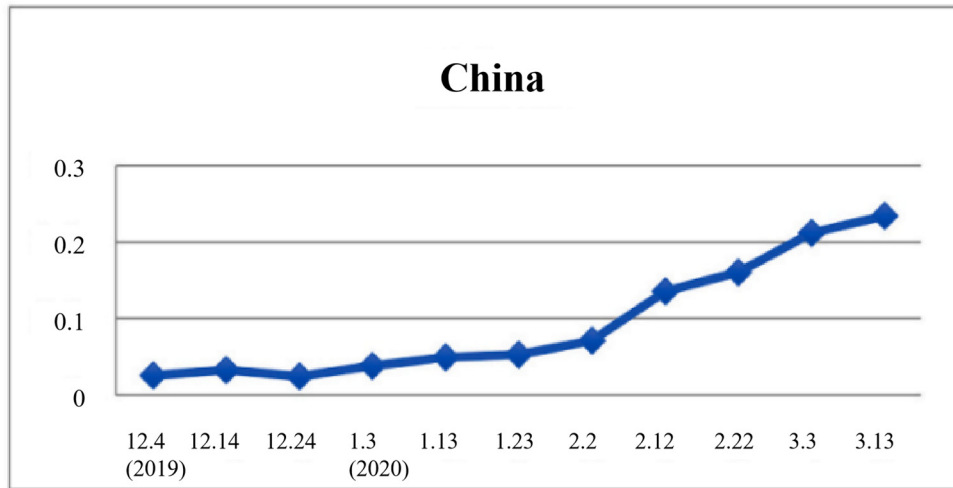


Figure 1. Abnormal returns of medical portfolios in China's markets [3]

2.4. The impact of changes in China's stock market on stock markets of other regions during COVID-19

There is not a dramatic spillover effect between Chinese and other region's stock market as shown in table 3.

Table 3. Volatility spillover effect between Chinese stock market and other stock markets during COVID-19 [1]

	a <sub>ii</sub>	g <sub>ii</sub>	a <sub>ij</sub>	g <sub>ij</sub>
CHN→USA	0.3548	0.8601	0.0097	-0.0002
	[2.7753]	[2.8194]	[4.549]	[0.0578]
USA→CHN	0.3985	0.8770	0.0778	-0.0947
	[3.8065]	[2.8539]	[2.7228]	[1.9669]
CHN→JPN	0.3723**	0.8887***	-0.0220	0.0135
	[0.1674]	[0.1234]	[0.0798]	[0.1466]
JPN→CHN	0.3539***	0.8971***	-0.0169	-0.0345
	[0.0900]	[0.0590]	[0.1755]	[0.1033]
CHN→HK	0.4031***	0.9075***	0.1412	-0.0010
	[0.1250]	[0.1293]	[0.1200]	[0.0021]
HK→CHN	0.1684**	0.9091***	-0.1076	0.0012
	[0.0828]	[0.1108]	[0.2035]	[0.004]
CHN→KR	0.4155**	0.8500***	0.0060	0.0041
	[0.1625]	[0.1744]	[0.0456]	[0.0338]
Kr→CHN	0.4314***	0.8443***	-0.0164	0.0056
	[0.1029]	[0.0788]	[0.0593]	[0.400]
CHN→GER	0.3798**	0.9265***	0.5389	-0.0252
	[0.1563]	[0.1169]	[1.8367]	[0.2042]
GER→CHN	0.2991*	0.8690**	-0.0161	-0.0060
	[0.1663]	[0.4179]	[0.1752]	[0.1281]

In the table,  $g_{ii}$  represents the duration of self-volatility of the domestic stock markets. And the  $g_{ij}$  refers to the duration of the volatility spillover effect between the domestic and other regions' stock markets. The researcher can test whether the spillover effect happened between stock market  $i$  and stock market  $j$  by checking whether  $a_{ij}$  is equal to  $g_{ij}$  and also equal to 0. As shown in the following table, the  $g_{ij}$  is almost equal to 0 and the  $g_{ii}$  is more than 0 and close to 1. Therefore, a general view can be drawn that the spillover effect between China and other regions was not significant but would last for a while during COVID-19.

### 3. THE IMPACT OF COVID-19 ON CHINESE INVESTORS

The author hopes to find some changes in the risk appetite of investors brought by Covid-19. Risk appetite can be defined as how willing investors are to hold risky assets [4]. In other words, it is a capacity for risk-bearing [5]. And it depends on the uncertainty of the macroeconomic environment and the preference of investors [4].

The author uses the following figure to show the changes in risk appetite before and during COVID-19.

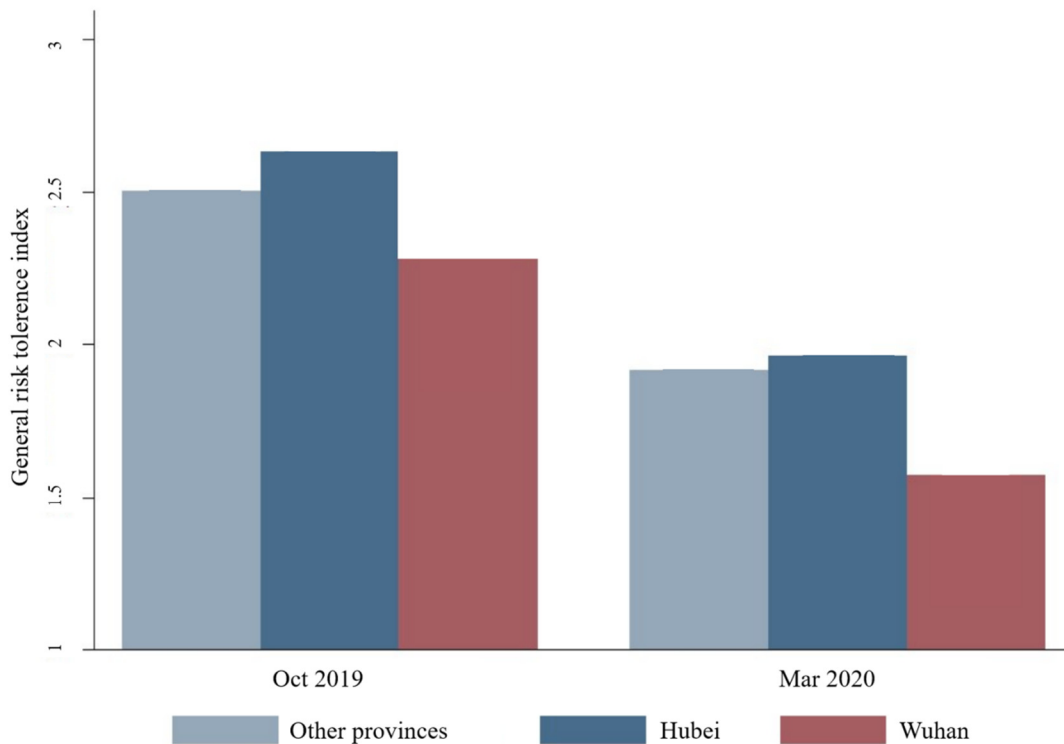


Figure 2. The changes of risk appetite in China [6]

In general, these three groups of investors had a lower level of risk tolerance during CONVID-19 than they had before the pandemic outbreak. The index was defined by whether investors were willing to take risk and how much risk they could afford. Before the outbreak, as the index shows, all the three group are more than 2. However, after the outbreak, all these three groups of people are lower than 2. So we can conclude that there is a significant decrease in Chinese investors' risk appetite.

Investor sentiment is also a factor for investors when making decisions. It can be a measurement to show an investor's negative or positive perspective on the stock market [7]. Investor sentiment has a positive correlation with the price of assets [8].

The author use the following table to show a specific results which can give direct conclusion about the impact of Chinese investors' sentiment brought by pandemic.

Table 4. The shock in China brought by investor sentiment during COVID-19 [9]

Variables	(1)	(2)
	Sent	Sent
Post × treat	-0.0552***	-0.0262**

Post means the time of the outbreak and the time after the outbreak was set as a fixed positive number. And treat represents the shock suffered by companies brought by investors during the epidemic. The result in the first column shows the investor sentiment changes in the whole of China. The number (-0.0552) means the pandemic made turnover rates decrease on the stock market and investor sentiment was negative. And the second column focus on some provinces that had a more serious pandemic. The number (-0.0262) shows a greater negative impact of the epidemic has hit listed companies and investor sentiment in these provinces. The number of post is positive, but the results are negative. So the shock brought by investors are negative because of the negative investor sentiment. In other words, investors held more negative attitude to stock market during pandemic so that they may decrease investment which give a negative effect to stock market. This result is consistent with Zhai et al. [10], who report negative cumulative abnormal returns (CARs), reflecting the negative investor sentiment during COVID-19.

#### **4. REASONS FOR THESE PHENOMENA DURING COVID-19**

This analysis shows some phenomena that happened during COVID-19 and tries to find the reason for those phenomena. The main reason is information. The government can respond to pandemics very quickly if they have enough information to deal with these kinds of emergencies, and with the speed of information's dissemination, they can respond to them very quickly. This can explain why volatility increased slightly in the domestic stock market but no significant spillover effect happened between China and different regions. Second, different educational levels of people can also lead to different decisions. Third, investors' fear and uncertainty can cause people to have negative emotions so that they cannot make proper decisions.

##### **4.1. Experience**

As mentioned before, on the whole, the volatility of the stock market during the COVID-19 pandemic was less than that during SARS. So the author thinks it's probably an effect of experience. In 2002, people didn't have enough experience to face such a serious emergency. The information leftover from SARS's experience can be used by the government as a reference to formulate policies for the COVID-19. Therefore, it can be seen that the country learned from the experience of SARS and took immediate action after COVID-19 outbreak.

Besides, unlike 2002, information travels fast in 2019. In this era of rapid information transmission, people acquire new information at a faster speed and from more resources so that we can respond to emergencies faster

and take action. Therefore, this time we didn't make it worse.

##### **4.2. Different education level**

According to results shown in the seventh census in China, compared with 2000, China only had 49 million college students in 2000. However, there were 218 million college students in 2020. This means that the level of education continues to rise. On the one hand, when faced with emergencies, people's methods can be more scientific and orderly. More people get a more accurate understanding of investment now so that more and more people can make proper decisions for themselves instead of believing agents completely. It can not only distribute property more fairly but also decrease the frequency of cheating incidents. On the other hand, when a public health emergency occurs, more talents in the financial field will help coordinate and stabilize the financial market and prevent volatility spillover from causing more serious consequences.

##### **4.3. Investors' fear and uncertainty**

When investors do not have a good view of some markets, or when some external information affects investors, they will take corresponding actions, resulting in market fluctuations. When the COVID-19 outbreak started, most of the people could not have a positive emotion because of fear. According to Dong Hongmei [11], a psychological study published by the Chinese Academy of Social Sciences showed that 79.3% of people in China expressed strong concern and 40.1% expressed strong fear.

The author thinks a reason for this is the lack of enough information and the ability to do independent thinking. It's easier to know how many people die every day, but they don't know any positive information. Similarly, during that time, not every investor could keep still and think of the stock market logically and calmly. Some investors could only stare at the change of numbers and could not think much more hope in the stock market because of negative belief.

It is related to investor sentiment, which is a view held by investors whether they think a stock is positive or not. To put it simply, it is an attitude and cognition generated by consumers before making individual decisions. Different attitudes will lead to different consumer behaviors, which can even influence the whole market. During the pandemic, when investors can not see the possibility of a return in a market, people who held some stocks would want to sell stocks. After more and more stockholders sell their stocks, the confidence of those who maintain the operation of the company or industry will be attacked. At the same time, this phenomenon, the loss of investors, can also be detected by some people who have no sense of investment but are good at

analyzing the stock market or collecting information from the market. Then, the negative information of this bad stock situation will be conveyed to more investors. Under the guidance of multiple factors, stock prices will continue to decline. Finally, more investors are unwilling to invest in the stock and even the market, which is creating a vicious circle. Similarly, if investors have a positive attitude towards a company's stock or market, it is likely to attract more people to buy the stock or the stock in the market. Finally, the stock price will also rise.

Therefore, the above four reasons can be summarized as the fluctuations of stock markets and investors are mainly caused by information.

## 5. SUGGESTIONS

In response to these problems and reasons mentioned above, the author makes some suggestions to the government, market regulators, and investors.

First, the government needs to take action in time so that it can keep the external social environment under control. In this way, investors can feel at ease carrying out investment work. For example, governments need to optimize the way of conveying information. Information comes from everywhere, such as websites, social media, newspapers, emails, and so on. People receive and learn all sorts of information every day and are affected by sorts of information. It's no doubt that, from a positive perspective, faster information conveying speed makes our life more convenient. Therefore, the relevant government departments or authoritative research institutions should release actual risk information timely, accurate, and reliable scientific research results, effective prevention measures, and feasible diagnostic programs. At the same time, relevant departments should be timely control the rumor spreading. Government and market regulators need to prevent the spread of false news through various channels and targeted responses. Optimizing the way of conveying information can stabilize public opinion and sentiment, giving investors feelings of trust and guidance.

However, another problem is information asymmetry. Information asymmetry often occurs between people who don't have some private information and people who have these pieces of information [12]. The result of this unequal condition is those who have private information will make better decisions. But solutions do exist. For governments and market regulators to establish a normative and legal disclosure system. This can not only help investors to have a more accurate understanding of the market, but also help government departments supervise enterprises.

For investors, they need to learn more real and useful things about the stock market and portfolio which can help them avoid the 'herd effect'. The herd effect is also known as "conformity psychology" and refers to the

tendency to be influenced by others when someone makes his own decisions. They should integrate existing information to make their own decisions. Keep a clear head and reason, so that investors can not be overly influenced by negative information when making investments.

## 6. CONCLUSION

This analysis shows some phenomena that happened during COVID-19 and tries to find the reason for those phenomena. The main reason is driven by information, different people who play different roles would take different actions in China. These actions made some changes happen in stock markets and investors. The author suggests that the government and market regulators need to take timely actions, optimize the way of conveying information, and promote multilateral cooperation. For investors, the author thinks they need to learn more about the stock market and portfolio.

Something else that needs to be mentioned is that the analyses are only at the theoretical level and do not include any empirical analysis. In the future, the author may add more empirical analyses and models to show more reliable data and results.

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