

Research on the Impact of COVID-19 on China's Capital Market

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ABSTRACT

The outbreak of COVID-19 has a great impact on the development of China's capital market. Based on the event study method, this paper quantitatively analyzes the impact of COVID-19 on China's capital market as a whole and various industries. The results show that: first, the initial stage of the outbreak of Xinguan has a significant short-term negative impact on the capital market, and the impact effect reaches the peak on the second day of the event, but the outbreak of the overseas epidemic has brought significant positive effects on China's capital market; second, the short-term significant negative impact of the new crown epidemic on the capital market has obvious industry heterogeneity. Based on this, this paper puts forward policy suggestions to deal with public emergencies from three perspectives of the government, investors and enterprises, which is of great significance to maintain the stable development of the capital market.

Keywords: COVID-19 situation; capital market; event research method

1. INTRODUCTION

The novel coronavirus pneumonia (novel coronavirus epidemic) was rapidly swept across the globe in 2020. In January 20, 2020, general secretary Xi Jinping made important instructions on the epidemic of pneumonia caused by the new coronavirus, emphasizing that the safety and health of the people should be put first and firmly curb the spread of the epidemic. At present, under the leadership of the Party Central Committee with Comrade Xi Jinping as the core, China has achieved major strategic achievements in fighting against the new crown disease, and has created another magnificent feat in the history of human struggle with disease. However, overseas epidemic is still spreading. The spread of the epidemic has also brought great panic and volatility to the capital market. China's Shanghai Composite Index fell by 7.72% on the first trading day after the Spring Festival (February 3, 2020), the largest one-day decline since August 24, 2015, and the Shenzhen index fell by 8.45%, the largest one-day decline since February 27, 2007. Stock indexes of all countries around the world also plummeted in March, and many stock markets triggered fuse breakers. The U.S. stock market, unprecedented in history, triggered four fusions in a short half month from March 9 to March 18 (local time). With the continuous development of China's capital market, the stability of the capital market plays a more important role in China's financial stability. Therefore, the research on the transmission mechanism of the impact of the new crown epidemic on China's capital market, and put forward targeted policy suggestions, to stabilize the future, China is facing major public emergencies. It is of great significance to stabilize the capital market and financial market. At present, there are more researches on the impact of the

new epidemic on China in the academic circle, focusing on the macroeconomic field. The main viewpoints are divided into the following two categories. The first view is that the impact of the new epidemic on China's economy is limited, and the short-term effect is partial. Zhang Xiaojing, Zhang Xiaojing, et al. (2020) believe that the new epidemic has affected China's macro-economy through the path of supply and demand structure, import and export trade, public psychology and behavior, purchasing manager index and economic prosperity index, Liu Lei (2020) proposed that the impact of the new epidemic situation on China's economy is mainly manifested in the short term. Tang Renwu et al. (2020) believed that because of the particularity of China's economy, it is enough to resist external shocks. As an external factor affecting economic development, the new epidemic situation will only cause economic fluctuations in a short period of time. This new view will have a huge impact on China's economy in the short term. For example, Tong Jiadong and others (2020) believe that the new epidemic situation is expected to trigger two or three rounds of financial shocks. Due to the asynchronous spread of the epidemic, China, as an economy that has been controlled earlier, may also suffer from the impact of external uncertainty; Liu Shaobo et al. (2020) proposed that the COVID-19 will distort China's normal social and economic operation order and reduce the impact of the "troika" on economic growth. They have contributed to and severely damaged small and medium-sized enterprises and hindered the innovation process, thus causing a huge impact on China's economy that is difficult to recover in the short term.

As a public emergency, COVID-19 will not only have a great impact on the macro-economy, but also have a great impact on the stability of the capital market as a negative external impact. In the study of the impact of the new

epidemic on the capital market, Altig et al. (2020) found that the volatility of U.S. stock market rose rapidly in late February after the outbreak of the epidemic, and reached its peak in March; Fang Yi (2020) based on the frontier event analysis method with dynamic window period, found that the new outbreak had a significant impact on China's financial market risk, among which the impact on the stock market was the most significant; Zhang Zhiping (2020) By using the methods of industry heterogeneity analysis, inflection point analysis and event study, it was found that the short-term impact of COVID-19 on the capital market was severe; Yang Zihui et al. (2020) compared the impact of SARS and COVID-19 on China's capital market, and found that the impact of SARS on various industries in the capital market was not obvious, and there was a significant risk spillover effect among various industries during the new crown epidemic, Guo Ming (2020) proposed that the group panic in the face of the new crown epidemic increased the price fluctuation in the capital market et al. (2020) using the event study method, this paper studies the reactions of the U.S. and European stock markets to the fiscal and monetary policies of various countries during the period of the new crown epidemic, and finds that fiscal policy will increase investor uncertainty compared with monetary policy et al. (2020) selected three important time points of COVID-19 period, using event research method, found that after the outbreak of COVID-19, the decline of airline stock return was significantly greater than the change of overall market return.

To sum up, most scholars use event analysis method in the research on the impact of the new epidemic on capital market. Compared with the existing literature, this paper takes the development degree of the overseas epidemic situation into the scope of event analysis, compares the response differences of China's capital market under the important time points of the outbreak of the epidemic at home and abroad, and analyzes the differential impact of the new epidemic on various industries in the capital market.

2. RESEARCH DESIGN

2.1 Research methods

In this paper, the event research method proposed by Fama et al. (1969) is adopted. The specific method is to investigate the change trend and significance of the target variables before and after the occurrence of the event. We select three key time points and events, as shown in Table 1. In the selection of event window days, this paper draws lessons from (Park, 2004; maneenop) et al. In (2020), the five trading days before and after (- 5,5) with a total of 10 trading days are taken as the event period, and the window estimation period is [- 125, - 6], that is, from 125 to 6 trading days before the event date, a total of 120 trading days.

In the calculation of individual stock normal return, this paper uses the market model to calculate the normal return when there is no shock event. Taking the data in the window estimation period as the sample, the market return as the independent variable and the individual stock return as the dependent variable, the regression model is established:

$$R_{it} = \alpha + \beta_i * R_{mt} + \varepsilon_{it} \tag{1}$$

$$E[\varepsilon_{it}] = 0; \text{Var}[\varepsilon_{it}] = \sigma^2 \tag{2}$$

Among them, R_{it} represents the return rate of stock i on day t when there is no impact event, R_{mt} is the market return rate. The market return rate of this paper adopts the return rate of CSI 300 index, α and β_i are regression coefficients, and ε_{it} is the error term. Then, we calculate the abnormal return of the stock in the event period according to the normal return and the actual return of the stock.

$$AR_{it} = R_{it} - (\hat{\alpha} + \hat{\beta}_i * R_{mt}) \tag{3}$$

Among them, AR_{it} is the excess return rate of stock i in period t , R_{it} is the actual return rate of stock i during event t , and $\hat{\alpha}$ and $\hat{\beta}_i$ are the estimated values obtained by the least square method. Finally, the average abnormal return AAR_t and cumulative average abnormal return $CAAR_t$ are calculated, and whether AAR_t and $CAAR_t$ are significantly not equal to 0 is used to judge whether the event has an impact on the capital market. If it is significantly not equal to 0, it means that the market value deviates from the fair value.

$$AAR_t =$$

$$CAAR_{t(t1,t2)} = \sum_{t1}^{t2} AAR_t$$

2.2 Sample selection and data sources

This paper takes Shanghai and Shenzhen listed companies as research samples to analyze the impact of COVID-19 on capital market. The sample data is from Guotai'an database, and the return rate of CSI 300 index is selected as the market return rate

1. Considering the uncertainty of ST and *ST companies, they are eliminated.
2. Considering the integrity of the data, the companies listed after 2019 and the enterprises suspended due to major events in the window estimation period are excluded.

1. An empirical analysis of the impact of new crown epidemic on capital market

(1) Overall market impact

The ARR value of the overall average abnormal return of the capital market during the event period is shown in Table 2.

Table 2 empirical results of overall market ARR

Eventwindow	ARR1	Ttest	ARR2	Ttest	ARR3	Ttest
-5	-0.00134	-1.037	-0.00734***	-4.169	0.00842912***	2.959
-4	-0.00556***	-6.750	0.009502***	6.675	-0.0044479*	-1.691
-3	-0.00314*	-1.834	0.018575***	7.299	0.01141714***	5.969
-2	0.002988	1.453	-0.00315	-1.563	0.00344585	1.133
-1	-0.00754***	-4.012	-0.0036*	-1.795	-0.0028244*	-1.874
0	-0.00293	-1.586	0.004226**	2.094	0.00979564	4.431
1	-0.011**	-2.798	0.009522**	2.761	0.00109452***	0.587
2	-0.03656***	-6.004	-0.00568***	-3.051	0.00316911	1.331
3	0.014292	6.533	0.007278	1.783	0.01002052***	4.33
4	0.009635*	2.810	0.001977*	0.627	0.00005499	0.025
5	0.009872*	2.873	-0.01384***	-6.386	0.00483746***	3.241

Note: **, **, * are significant at 1%, 5% and 10% levels respectively.



Fig. 1 Variation Trend of AAR in each event period of COVID-19

Arr1 is the average excess return rate before and after the Wuhan Fengcheng event on January 23, 2020. It can be seen that four trading days in the first five trading days of the event are negative, and the previous trading day is even more negative, indicating that the development of the epidemic has brought obvious negative impact on the capital market. The first trading day after the event, February 3, 2020, was the first opening of the stock market after the Spring Festival holiday. Due to the rapid development of the new crown epidemic, the impact of investors on the economy caused by the new crown epidemic was uncertain, and there was strong panic in the market. The Shanghai stock index fell 7.72%, which set the biggest one-day decline since August 24, 2015, and the next day after the opening The ARR reached the lowest value in the event period, then turned to positive value and slowly recovered, indicating that the impact of Wuhan City closure event on capital market was short-term.

Arr2 is the average excess rate of return before and after the outbreak of the Italian epidemic on February 21, 2020. The outbreak of the Italian epidemic means that the overseas epidemic situation has entered into an adverse situation. However, the ARR of China's stock market is mostly positive on the day of the incident and after the outbreak.

Because the Chinese epidemic has turned around at that time, the development of the overseas epidemic has not had a significant negative impact on the capital market.

Arr2 is the average excess return before and after event 3, which did not cause significant negative impact on China's capital market. On and after the event, arr was positive, and three trading days were significantly positive. The reason is that China's outstanding performance in the fight against the new crown epidemic has strengthened the confidence of domestic and foreign investors in China's capital market. At the same time, Chinese enterprises have resumed their work and production and resumed economic development. The improvement of the domestic epidemic situation has stabilized the overall mood of the capital market.

On the whole, in the three events, the Wuhan City closure incident had the most obvious negative impact on the capital market (see Figure 1). With the effective control of the domestic epidemic situation, the successive outbreak of the epidemic overseas did not cause significant negative impact on the domestic capital market. On the contrary, the prevention and control effect of the epidemic situation at home and abroad further enhanced the investors' confidence in the domestic

capital market.

In the event period, the Carr value and change trend of the

overall average cumulative excess return of the capital market are shown in Table 3 and Figure 2 respectively.

Table 3 empirical results of overall Carr in the market

Eventwindow	CARR1	Ttest	CARR2	Ttest	CARR3	Ttest
-5	-0.00134	-1.037	-0.00734***	-4.169	0.008429***	2.959
-4	-0.0069***	-4.153	0.002161	0.607	0.003981	0.911
-3	-0.01004***	-4.255	0.020736***	3.804	0.015398***	3.041
-2	-0.00705**	-2.106	0.017587***	2.871	0.018844***	3.207
-1	-0.01459***	-3.650	0.013983**	2.108	0.01602**	2.565
0	-0.01752***	-3.998	0.018209***	2.63	0.025816***	3.825
1	-0.02852***	-4.695	0.027732***	3.547	0.02691***	3.834
2	-0.06508	-5.913	0.022053***	2.661	0.030079***	4.069
3	-0.05079***	-4.157	0.029331***	3.173	0.0401	5.111
4	-0.04115***	-3.142	0.031308***	3.212	0.040155***	4.898
5	-0.03128**	-2.257	0.017468	1.641	0.044992	5.403

Note: ***, **, * are significant at 1%, 5% and 10% levels respectively.

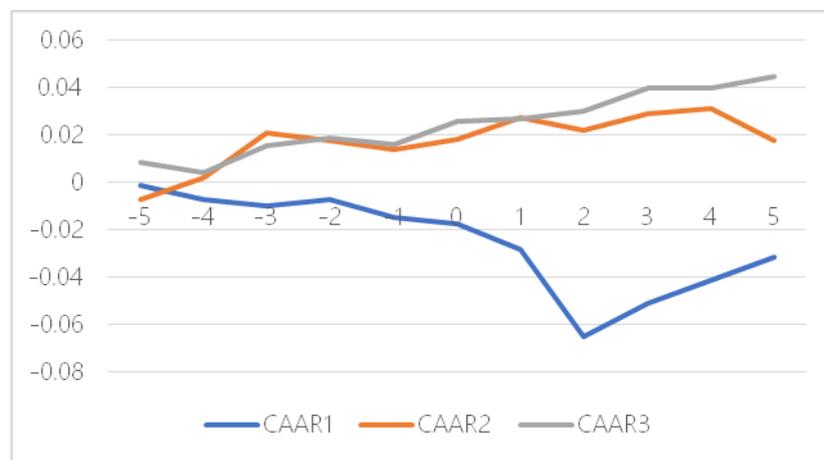


Fig. 2 the trend of CAAR change of COVID-19 in each event period

From the above chart, we can see that the cumulative average abnormal return rate CAAR was negative in all window periods of event one, and it decreased to the lowest value of -0.6508 on the second day of the event, which indicated that the event of Wuhan City closure sent a negative signal to the capital market. Although it rose slowly in the following three days, it was still significantly negative at the statistical level of 1%, indicating that the event of Wuhan City closure during the COVID-19 period had a short-term impact on the capital market. It has become a serious negative impact.

Event two turned positive four days before the event, and it

was significantly positive at the statistical level of 1% on both the day of the event and the four days after the event, and event three was positive in the event window period. It shows that with the improvement of domestic epidemic situation, the outbreak of overseas epidemic did not bring negative impact to China's capital market, but had a positive impact on the capital market.

(2) Industry impact

According to the industry classification standard of China Securities Regulatory Commission (2012), listed companies are divided into 19 industries. CAAR during the event period is shown in Table 4 and figure 3.

Table 4 average cumulative excess return by industry

industry	CAAR1	Ttest	CAAR2	Ttest	CAAR3	Ttest
Agriculture, forestry, animal husbandry and fishery	-0.08651	-1.224	-0.00512	-0.096	0.06999	1.461
Mining	-0.07776	-1.702	-0.01705	-0.483	-0.01694	-0.602
manufacturing	-0.00147	-0.037	0.02576	0.614	0.03005	1.578

Electricity, heat, gas and water production and supply	-0.06214	-1.406	0.00605	0.209	0.05387**	2.913
construction	-0.07083	-1.141	0.04140	0.795	0.03085	1.111
Wholesale and retail	-0.02740	-0.684	0.02381	0.955	0.05443*	2.036
Transportation, storage and postal services	-0.05581	-1.128	0.00562	0.218	0.05736	1.502
Accommodation and catering	-0.09753	-1.255	0.04305	0.710	0.09391	1.963
Information transmission, software and information technology services	0.08179	1.489	0.01347	0.172	0.02383	0.512
finance	-0.02635	-0.606	0.05257**	2.367	0.07316**	2.350
real estate	-0.06583	-1.382	0.02430	0.695	0.07618	1.640
Leasing and business services	-0.08074	-1.188	0.01096	0.271	0.03321	1.034
Scientific research and technology services	-0.02005	-0.523	0.01297	0.342	0.01619	0.639
Water conservancy, environment and public facilities management	0.00016	0.002	0.02272	0.504	0.03704	1.417
Residential services, repair and other services	-0.10241	-0.969	0.02960	0.367	0.12595**	2.466
education	0.04344	0.554	0.09819	1.561	0.00806	0.185
Health and social work	0.02552	0.486	-0.02231	-0.608	0.02785	0.611
Culture, sports and entertainment	-0.01339	-0.226	-0.04594	-0.998	0.02155	1.021
comprehensive	0.04298	0.734	0.01185	0.278	0.03832	0.922

Note: **, *, * are significant at 1%, 5% and 10% levels respectively

From the perspective of excess cumulative average rate of return (see table 3-3), all industries have been impacted by the new epidemic. During the event period of event 1, the industry as a whole suffered the most obvious negative impact. Except for the five industries of information transmission, software and information technology services, education, comprehensive, health and social work, water conservancy, environment and public facilities management, the excess cumulative average return of the other 14 industries was negative, including accommodation and catering industry, agriculture, forestry, animal husbandry and fishery, rent Leasing and business services have suffered the biggest negative impact. The five industries with positive CAAR are mainly because the outbreak of COVID-19 has increased the demand for information technology. During the epidemic period, the education industry has better used the information-based teaching means to carry out online education, making up for the impact of the inability to carry out offline education. At the same time, the outbreak of the epidemic has increased the medical demand of the whole society, and the orders of relevant medical companies have increased rapidly, which makes the new crown epidemic situation more effective. The pharmaceutical industry has had a positive impact. During the period of events 2 and 3, the negative impact on the industry as a whole was relatively

small, indicating that with the high efficiency of epidemic prevention and control in China and the first resumption of work and production, the outbreak of overseas epidemic did not have obvious negative impact on all industries in China.

3. CONCLUSION

In this paper, the event analysis method is used to select three important time points during the outbreak of COVID-19. Combined with the stock trading data of Listed Companies in Shenzhen and Shanghai, the paper calculates the average differential return and excess cumulative average return of the whole capital market and various industries in the time period, and draws the following conclusions:

(1) The outbreak of COVID-19 in China has caused significant negative impact on China's capital market as a whole, but the impact effect is short-term; under the correct leadership of the CPC Central Committee, China's epidemic prevention and control has achieved phased results, and investor sentiment has gradually recovered. Therefore, the outbreak of the overseas epidemic did not bring significant negative impact to China's capital market, but strengthened investor confidence. Capital markets have

had a positive impact.

(2) The impact of COVID-19 on various industries is different, and the negative impact on accommodation and catering industry, agriculture, forestry, animal husbandry and fishery, leasing and commercial service industry is the biggest.

Based on the above conclusions, this paper puts forward the following suggestions:

(1) In the event of a public emergency, investor confidence is crucial to the smooth operation of the capital market. Therefore, as investors, they should maintain a stable and rational investment psychology and avoid blind obedience. In the early stage of the epidemic, the local government did not make timely information disclosure. Under the unified deployment and leadership of the CPC Central Committee, local governments adopted the transparency of information, and under the leadership of the CPC Central Committee, the local governments adopted the transparency of information Open and timely measures effectively stabilize the market sentiment and reduce the negative impact of the new crown epidemic on the capital market. Therefore, in the face of public emergencies, the government should accurately release the relevant real situation of emergencies, stabilize investor sentiment and reduce the interference of untrue information on investors.

(2) The government should support and promote the development of emerging industries, promote consumption, stabilize domestic demand and promote the transformation of demand structure. At the beginning of the outbreak of COVID-19, the information industry was positively affected. With the outbreak of COVID-19, distance education and telemedicine were born. Therefore, it is necessary to further develop the information industry and support the development of relevant emerging industries. In addition, with the spread of the overseas epidemic, the global economic development is weak, and China is facing a serious shortage of external demand The negative impact on the domestic capital market should promote the transformation of China's demand structure, which is conducive to the recovery and development of China's economy. , structured upgrade.

(3) Enterprises should improve the ability of financial management and cash management, and improve the ability to resist risks. At the beginning of the outbreak of COVID-19 in China, it had a significant negative impact on accommodation and catering industry, agriculture, forestry, animal husbandry and fishery, leasing and commercial service industries. These industries generally have high demand for cash flow, so they are more vulnerable to the impact in the face of emergencies

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REFERENCES

- [1] He Chengying, Wen Yuechun, Chang Yali, Geng Xiaoxu. Measurement and analysis of the impact of new coronavirus pneumonia on China's economy [J]. *Research on quantitative economy, technology and economy*, 2020,37 (05): 3-22
- [2] Liu Shaobo, Cao Zhi, ye Xian. The new crown pneumonia epidemic and China's economy: basic judgement, impact characteristics and policy synergy [J]. *financial economics research*, 2020,35 (03): 17-27.
- [3] Zhang Xiaojing, Liu Lei novel coronavirus pneumonia under the new paradigm of macroeconomic analysis and economic growth. Also on the impact of new coronavirus pneumonia on the growth of [J]. *and economic research*, 2020,55 (06): 4-21.
- [4] Tang Renwu, Li Chuqiao, ye Tianxi. Damage of new coronavirus pneumonia on China's economic development and countermeasures [J]. *Economic and management research*, 2020,41 (05): 3-13
- [5] Tong Jiadong, Sheng Bin, Jiang Dianchun,
- [6] Fang Yi, Yu Bo, Wang Wei. Risk measurement and control of China's financial market under the influence of COVID-19 [J]. *Journal of Central University of Finance and economics*, 2020 (08): 116-128
- [7] Zhang Zhiping, Zhu Siying, LV Fengjing. Study on the capital market impact effect of COVID-19 [J]. *Friends of accounting*, 2020 (18): 131-137
- [8] Yang Zihui, Chen Yutian, Zhang Pingmiao. Macroeconomic impact, financial risk transmission and governance response under major public emergencies [J]. *Management world*, 2020, 36 (05): 13-35 + 7
- [9] Liu Ting, Guo Ming. The mechanism of the impact of new crown pneumonia on systemic financial risks [J]. *Economic Forum* 2020 (06): 67-72.
- [10] Altig D, Baker S, Barrero J M, et al. Economic uncertainty before and during the covid-19 pandemic[J]. *Journal of Public Economics*, 2020: 104274.
- [11] Worthington* A, Valadkhani A. Measuring the impact of natural disasters on capital markets: an empirical application using intervention analysis[J]. *Applied Economics*, 2004, 36(19): 2177-2186.
- [12] Maneenop S, Kotcharin S. The impacts of COVID-19 on the global airline industry: An event study approach[J]. *Journal of Air Transport Management*, 2020: 101920.

[13] Fama E F, Fisher L, Jensen M C, et al. The adjustment of stock prices to new information[J]. *International economic review*, 1969, 10(1): 1-21.

[14] Kim J. Heyden, Thomas Heyden, Market Reactions to the Arrival and Containment of COVID-19: An Event Study, *Finance Research Letters* (2020)

[15] Park N K. A guide to using event study methods in multi-country settings[J]. *Strategic Management Journal*, 2004, 25(7): 655-668.