

# ***Research on the Impact of COVID-19 on the Medical Industry in China***

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**Abstract:** From the end of 2019 when the COVID-19 pandemic broke out in China to the end of 2022 when the Chinese government announced the removal of the containment of the pandemic situation, the 3-year-long pandemic has caused a large impact on the medical industry. Through a study on the trend of PE (price to earnings ratio) value of A shares in the medical industry and a linear regression analysis, this paper explores the impact of the COVID-19 pandemic on the medical industry as well as its correlation to the severity of the pandemic situation and China's pandemic prevention policy. It was found that, on the whole, the PE value of the medical industry and the industry valuation increased significantly in comparison with that before the pandemic. Although its changing pattern in the past three years has no obvious correlation with the severity of the pandemic situation in China, it is quite consistent with the three stages of China's pandemic prevention divided according to the pandemic prevention and control policies.

**Keywords:** COVID-19, pandemic, China, medical industry, PE value

## **1. Introduction**

At the end of 2019, the novel coronavirus appeared in Wuhan, China and spread rapidly, affecting all parts of China. Since then, the government began to implement pandemic control. At the end of 2022, China's pandemic prevention policy was released, and the three-year pandemic control officially ended. The impact of the pandemic on the medical industry can be summarized from two sides. On the one hand, no industry can survive the global public health emergency. Under the impact of the pandemic, due to the delay in the hospital procurement plans during the pandemic, patients avoid going to the hospital as much as possible, and the medical industry as well as other industries are adversely affected by the resumption of work and production. On the other hand, this global public health emergency also provides an opportunity for the development and improvement of China's medical industry. During the pandemic, the demand for related products and medical services and devices has increased sharply. At the same time, triggered by the economic recovery and the subsequent supportive policies, investment has also grown rapidly. All of these have brought new opportunities to the medical industry in China. In this context, this paper reviews and studies the economic impact of the COVID-19 pandemic on the medical industry in China during the past three years through a linear regression analysis of the stock market data. This study can be helpful to readers to understand the impact of the pandemic on the medical industry as well as its correlation to the severity of the pandemic situation and China's pandemic prevention policy.

## 2. Literature Review

Regarding the impact of the pandemic on China's economy, previous relevant papers mostly focused on the overall impact of the pandemic on China's economy during the first two years. For instance, Yi Yang and Junjun Zhang analyzed the impact of COVID-19 on the economic system from the perspective of finance [1] and Kaifan Cai reviewed the impact of COVID-19 on the economy and its response [2]. On the other side, research considering the medical industry focuses more on the analysis of the impact of the pandemic on the development and changes of the medical industry itself. For example, Yilin Yang studied the impact of global COVID-19 on the economy and the medical industry [3]. Lihua Zhou explored the impact of COVID-19 on the medical industry [4]. In addition, there are also papers researching the impact of the COVID-19 pandemic on the medical industry through the U.S. stock market. In Shuai Li and Qiang Zhang's paper, they conducted an empirical study on the impact of the COVID-19 pandemic on the earnings of the US stock medical industry [5]. However, few papers focused on the economic impact of the pandemic on the medical industry through China's stock market. Therefore, this article focuses on the economic impact of the pandemic on the medical industry and explores the impact factors through a linear regression analysis based on China's stock market data.

## 3. The Impact of COVID-19 on the Medical Industry in China

By using the current market value and the PE value of enterprises to evaluate the medical industry, through the industrial derived indicator for day-trading on China Stock Market & Accounting Research Database (CSMAR) [6], this paper explores the impact of the pandemic on the stock market and its influencing factors by studying the trend of the PE value of A shares in the medical industry from the beginning of 2018 to the end of 2022. By taking the date as the x-axis and the PE value as the y-axis, the author marked the daily PE value of the medical industry from the beginning of 2018 to the end of 2022 in the coordinate system, and the trend is shown in Figure 1.

The COVID-19 pandemic broke out in China at the end of December 2019. Taking the end of 2019 and the beginning of 2020 as the dividing point, the data can be divided into two stages as shown in Figure 2: one is the period before the outbreak of the pandemic, ranging from the beginning of 2019 to the end of 2019; the other is the period after the outbreak of the pandemic, ranging from the beginning of 2020 to the end of 2022. Taking the date as the x-axis and the PE value as the y-axis, through linear regression analysis on the data, the regression result before the outbreak of the pandemic is  $y=0.0936x+39.4158$ , and the regression result after the outbreak of the pandemic is  $y=-0.0521x+106.8797$ . It can be concluded that the stock value of the medical industry is greatly affected by the pandemic, and the valuation of the medical industry has risen significantly.

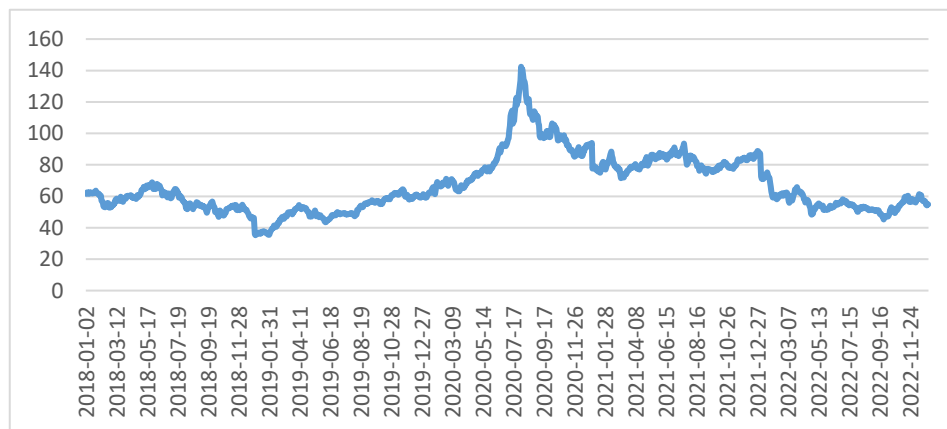


Figure 1: Trend chart of the daily PE value of the medical industry.

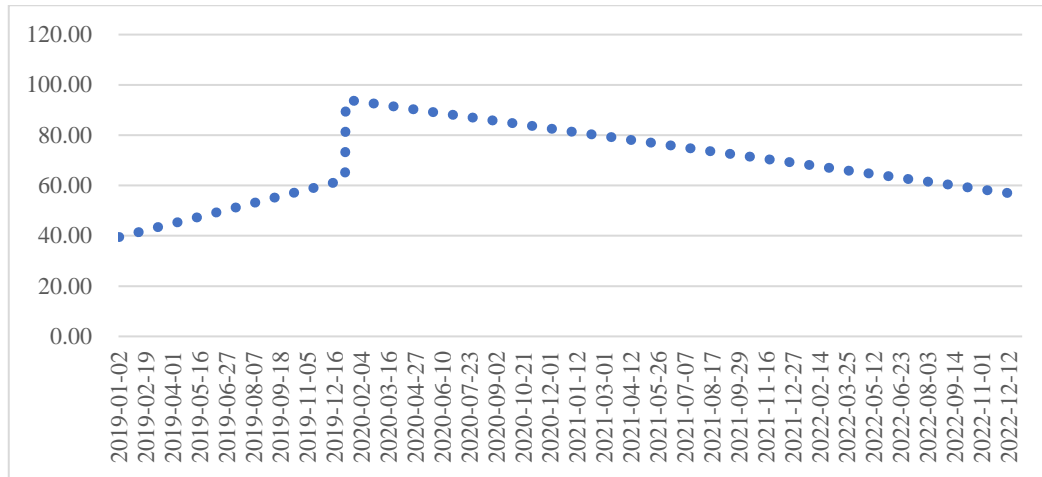


Figure 2: Linear regression diagram with the end of 2019 as the cut-off point.

## 4. Research on the Impact Factors

### 4.1. The Severity of the Pandemic Situation

By sorting out the daily pandemic situation reports of the National Health Commission of the People's Republic of China from the beginning of 2020 to the end of 2022 [7], and comparing the daily number of confirmed cases of COVID-19 in China within the three years with the daily industry PE value of the medical industry, Figure 3 was obtained. According to Figure 3, the PE value of the medical industry is not significantly related to the daily number of confirmed cases of COVID-19 in China, in which the latter reflects the seriousness of the pandemic. It can be concluded that although the industry valuation of the medical industry is largely affected by the pandemic, it is not significantly related to the development trend and severity of the pandemic.

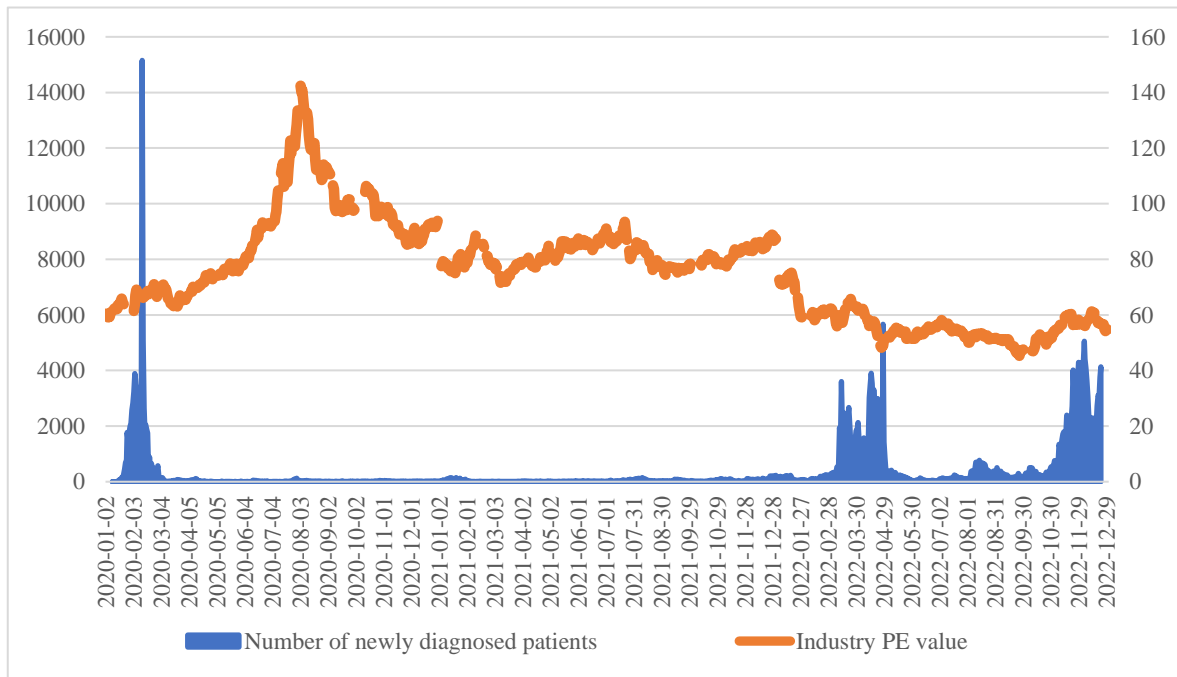


Figure 3: Combination chart of the PE value of the medical industry and the number of newly diagnosed COVID-19 patients each day.

## 4.2. The Stage of the Pandemic Prevention and Control

According to the white paper "Fighting COVID-19: China in Action" [8] issued by the State Council Information Office on June 7, 2022, and the speech delivered by Nanshan Zhong in the national anti-pandemic lecture hall in colleges and universities [9] as well as Wannian Liang's viewpoints on the pandemic prevention stages [10], China's pandemic prevention and control is mainly divided into three stages. As shown in Figure 4, the first stage is from the end of 2019 to May 31, 2020, which is mainly for pandemic prevention. The second stage is from June 2020 to the end of 2021, which mostly consists of external defense input and internal defense rebound. The third stage is a stage of "dynamic clearing" throughout the whole year of 2022. By taking May 31, 2020 and the end of 2021 as the two dividing points, the data is divided into three stages. The regression result of the first stage is  $y=0.1547x+61.169$ , the second stage is  $y=-0.0689x+108.72$ , and the third stage is  $y=-0.0447x+83.42$ . It is obvious that the PE value of the medical industry is largely affected by the relevant policies. Dealing with the sudden breakout of the pandemic was the main task during the first stage. At this time, most industries and all departments of the hospital joined in the war against the novel coronavirus. Large numbers of materials related to pandemic prevention were produced, and the PE value of the industry rose rapidly. In the second stage, the medical industry gradually returned to normal, but there was still a large number of pandemic prevention-related materials being produced, and the PE value of the industry overall increased significantly in this stage. In the third stage, all aspects gradually returned to normal, and the overall PE value decreased. To conclude, in the second and third stages, life and production gradually returned to normal, which correlates to the steady decline of the PE value of the medical industry on the whole.

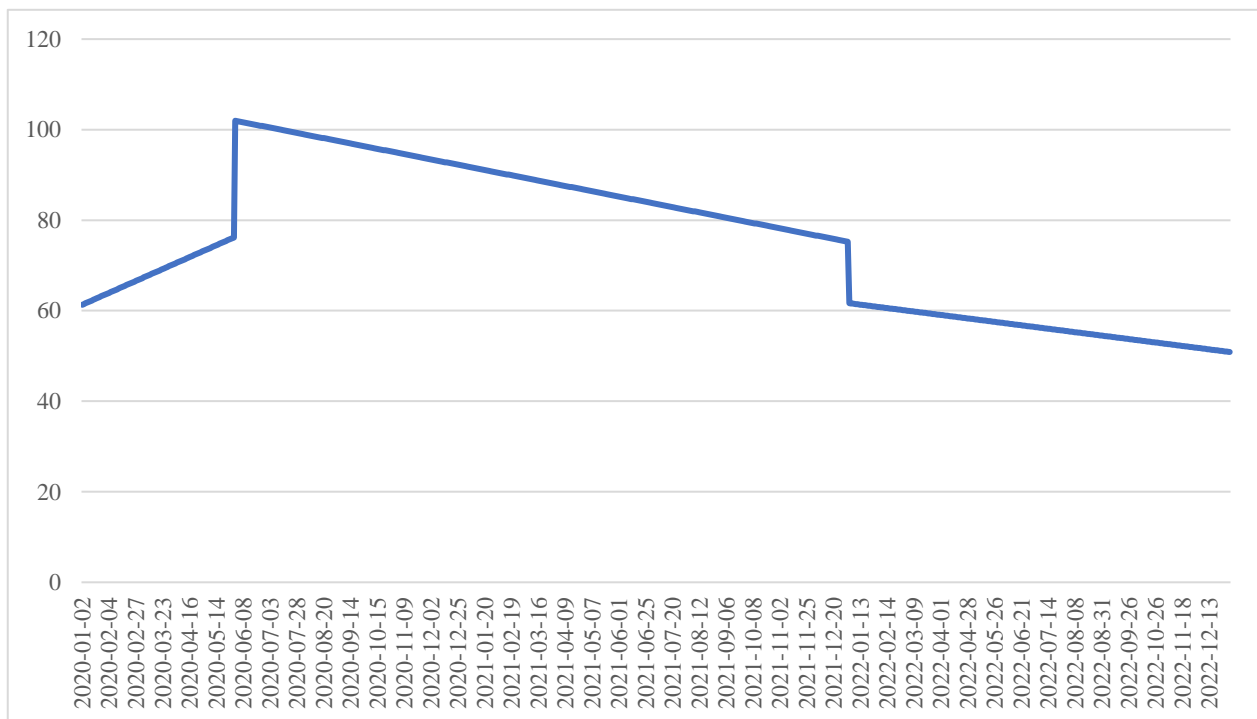


Figure 4: Linear regression diagram of the PE value of the medical industry (cut-off points: May 31, 2020 and the end of 2021).

## 5. Conclusion

In conclusion, the COVID-19 pandemic in the past three years has had a great impact on China's medical industry. Under the closure and control policy of the pandemic, production almost stopped,

and people from all walks of life were engaged in the war against the coronavirus. Later, as the situation of the pandemic was controlled, life and production gradually returned to what it was like before the pandemic. On December 7, 2022, China officially lifted the prevention controls of the pandemic. After reviewing the impact of the pandemic on China's medical industry, it was found that, on the whole, the PE value of the medical industry as well as the industry valuation increased significantly compared with that before the pandemic. The changing pattern in the past three years has no obvious correlation with the severity of the pandemic situation in China, but is highly consistent with China's pandemic prevention policy. However, this paper only explored the impact of the severity of the pandemic situation and the pandemic prevention policy on the PE value of the medical industry, more related impact factors can be studied in future research.

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