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Article

Government policies and their impact on the China securities index 300 stock market: Insights from the COVID-19 crisis

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Abstract: During crisis events, the government implements many policies to control the development of the crisis and stimulate the economy damaged by the crisis. The government plays a very important role during the crisis. The stock market is a reflection of a country's economic situation. This article takes the Chinese government policies during the COVID-19 crisis as the research object and analyzes the impact of government policies on the CSI300 index. The following conclusion is drawn: not all government restrictions will cause a decline in stock market prices, among which the Wuhan lockdown policy has promoted the rise of the CSI300 index. The two stimulus policies implemented by the Chinese government are both conducive to the rise of CSI300 index. During the COVID-19 crisis, investors holding high assets, high leverage, and low profitability companies will be significantly negatively affected after the government implements restrictive policies. After the government implements stimulus policies, investors holding high asset and high leverage companies will suffer losses. Investors who hold low asset, low leverage, and high profitability companies will have profits. And this article also finds that the size of company assets is an important driving factor for abnormal returns.

Keywords: COVID-19 crisis; government policy; event study method

1. Introduction

COVID-19 is a highly contagious virus, the outbreak of which has had a significant negative impact on the world economy. The Chinese government played a very important role in the outbreak of the virus. The virus was first discovered in December 2019 in Wuhan, China, and then in January 2020 it began to spread throughout China. The Chinese government blocked all outbound traffic from Wuhan on 23 January 2020 in order to prevent further spread of the virus. Moreover, the Chinese government closed all public places, prohibited people from social gatherings, and banned vehicles from travelling within the city of Wuhan (Pan, 2020). At that time, China was in the midst of the Chinese New Year holiday, the population was moving fast, and Wuhan was one of the major transport hubs in China. Although the Chinese government implemented the most restrictive policies to prevent COVID-19 from spreading out of Wuhan, it was inevitable that COVID-19 would spread rapidly within China. According to data released by the Chinese government, the cumulative number of confirmed cases across China exceeded 50,000 on 12 February 2020 alone. In addition to Wuhan, other provinces and cities in China introduced policies to limit the spread of the virus, such as restricting the movement and gathering of residents. It was not until May 2020 that China successfully contained the spread of the epidemic.

Although the Chinese government's restrictive policies have successfully

contained the spread of the epidemic, they have slowed economic activity and hurt China's economic development. China's GDP experienced negative growth of up to −6.8 percent in the first quarter of 2020, which is the first negative GDP growth in China in nearly 20 years. Most industries in China were negatively impacted to varying degrees. The accommodation and food service sector were the most negatively affected, with revenue in the first quarter of 2020 down 35.3% year on year. Not only the real economy, China's stock market also suffered severely. The Shanghai Stock Exchange (SSE), which is the largest stock index in China, saw a 12.5 percent drop in the first quarter of 2020. Investors suffered very serious losses. In order to get China's economy out of the epidemic quickly, the Chinese government used several fiscal policies to stimulate the economy, such as lowering social security fees and rents for private companies. Although the Chinese stock market has rebounded to some extent as a result of the stimulus policies, the exact impact of these government policies on the stock market still needs to be explored.

With the rapid development of China's economy, China's stock market has received more and more attention from investors and scholars. There are many articles studying the impact of the COVID-19 crisis on the Chinese stock market. However, the current research basically focuses on the impact of the COVID-19 crisis on China's stock market and neglects the research on the impact of government policies on the stock market during the epidemic. During this COVID-19 crisis, not only the Chinese government, but also the governments of developing countries such as Malaysia and India, and developed countries such as the United States and Australia have adopted many policies (Goel et al., 2021; Herron and Manuel, 2022; O'Sullivan et al., 2020; Shah et al., 2020). Because of the strong government intervention in the financial markets during the epidemic, the volatility in the financial markets was not only caused by the crisis itself, but also by the impact of government policies on the volatility of the financial markets. This shows that the impact of government policies on financial markets during the COVID-19 crisis cannot be ignored.

The innovations and contributions of this paper are as follows. China is the first country in the world to be affected by COVID-19, and one of the few countries that is rapidly emerging from the epidemic and achieving positive GDP growth in 2020. It is more representative to take China as the research object. By studying the impact of the policies implemented by the Chinese government during the COVID-19 crisis on the abnormal return of CSI300, this paper makes up for the lack of research on the impact of the policies of the Chinese government on the stock market during the epidemic. This paper then chooses four financial indicators to further analyze the impact of government policies on abnormal returns of companies with different financial status during the COVID-19 crisis from the perspective of company finance. It fills a gap in the lack of research on the impact of government policies on the Chinese stock market during the COVID-19 crisis from a company finance perspective. From a macro perspective, this paper provides an in-depth analysis of the impact of government policies on the stock market during the COVID-19 crisis, which can help the government improve its risk prevention measures and macro-control policies during public health events. From a micro perspective, this study can help investors adjust and improve their investment strategies, and provide a reference for investors to reduce risks and adjust their investment structure when similar events occur next time (Xu et

al., 2022).

The remainder of the paper is structured as follows. Chapter 2 describes the theoretical foundations and existing research. Chapter 3 describes the data sources and research methodology. Chapter 4 analyses the empirical results. Chapter 5 summaries and makes some recommendations. Past research on the COVID-19 crisis generally focuses on the impact of the COVID-19 crisis itself on China's stock market index, but ignores the study of government policies on the stock market during the crisis. And in further research, scholars generally focus on studying the impact of the epidemic from the perspective of the company's sector, ignoring the impact during the crisis from the perspective of the company's finance. This paper mainly studies the impact of government policies on the stock market during the COVID-19 crisis, and makes an in-depth study by differentiating companies by their financial situation.

2. Literature review

2.1. Theoretical foundation

The efficient market hypothesis is an important theory in modern finance. The theory suggests that investors in the market are rational and investors can quickly reflect the information they obtain into the movement of stock prices. The price of the stock can fully reflect all the information available in the market and no one can get excess returns (Fama et al., 1969). However, with the development of finance, the opposition to the efficient market hypothesis has grown. Behavioral finance has developed rapidly on this basis.

Proponents of behavioral finance believe that the personality of investors affects their investment decisions. Both professional and amateur investors are not absolutely rational and can overreact to information (Birău, 2012). Human beings have emotions such as fear, anxiety, jealousy and greed, all of which can interfere with investors' investment decisions to some extent (Birău, 2011). Griffith (2020) believes that human emotions interfere with investment decisions. He used the VAR model and TGARCH model to investigate whether the four emotions of fear, joy, gloom and stressors have an impact on market returns. The empirical results found that investors' fear has a significant and long-lasting effect on market returns and volatility, and that investor's emotions can be used to predict stock market returns. Vasileiou (2022) also opposes the efficient market hypothesis. He believes that the stock market would be affected by investor's emotions when encountering crisis events, so it could not respond reasonably to the impact of the event. He demonstrated that people's fear during the COVID-19 crisis affected the movements of the U.S. stock market through Granger causality tests and GARCH models. Since human beings have emotions that can lead to overreaction or underreaction to information, it is difficult to confirm whether the response of capital markets to government policies is consistent with the efficient market hypothesis. The study of investors' reaction to government policies during the COVID-19 crisis is significance for investors to obtain excess returns.

2.2. Public health crises on the stock market

There have been many public health outbreaks prior to the COVID-19 crisis, and

previous studies of public health events are also relevant to this paper. Before the emergence of the COVID-19 crisis, China also experienced two public health crises, SARS and H7N9. The two viruses had serious negative impacts on China's economy and financial market (Qiu et al., 2018). Chen (2010) used the event study approach to investigate the impact of the SARS virus on Taiwan's stock market. He found that after the outbreak of SARS, the cumulative abnormal return rate of hotel stocks in Taiwan was negative, and SARS virus had a significant negative impact on the hotel stocks in Taiwan. Nippani and Washer (2004) examined the impact of the SARS virus on the stock markets of several countries and found that the SARS virus had a short-term negative impact on China's stock market. Loh (2006) examined the impact of the SARS virus on airline stocks in the stock markets of several countries and found that the SARS virus causes an increase in stock volatility. Jiang (2017) found that the H7N9 virus has a negative impact on the Chinese stock market because the H7N9 virus triggers pessimism among investors which in turn affects investment decisions. Nguyen et al. (2021) examined the impact of the SARS virus and the H7N9 virus on more than 3000 companies in China. The study found that both diseases had a significant negative impact on the stock returns of most companies in China, and the impact lasted up to 10 days after the event.

There have been many serious public health crises in other countries around the world. Ichev and Marinč (2018) found that the Ebola outbreak had a negative impact on African and US stock markets. The closer the company is to the Ebola outbreak, the stronger the negative impact will be on its stock price. Del and Paltrinieri (2017) found that the Ebola virus severely affected African mutual fund's liquidity, which further affected the fund's performance and return on assets. Guo (2023) examined the impact of the H1N1 virus on the portfolios of U.S. residents and found that the virus did not affect stock market participation, but would affect the stock of residents investing in risky assets. For every 1% increase in the death rate caused by the H1N1 virus, the stock of residents investing in risky assets decreases by 0.27%. Macciocchi et al. (2016) analyzed the impact of the Zika virus on the stock markets of Brazil, Argentina and Mexico. The results showed that the average return of Brazil's stock market on the day after the Zika virus incident was negative, and there was no significant change in the other two countries.

Since the COVID-19 crisis had a negative impact on economies all over the world, numerous scholars have studied the impact of the COVID-19 crisis on stock markets around the world. Mazur and Vega (2021) examined the collapse of the US S&P 500 index in March 2020 caused by the COVID-19 crisis as the research object. He found that stocks in the video, healthcare, and software sectors posted high positive returns, while stocks in the oil, entertainment and hospitality sectors fell sharply. And stocks with falling prices showed extreme asymmetry, which was negatively correlated with stock returns. Ganie et al. (2022) examined the impact of the COVID-19 crisis on the returns and volatility of stock markets in the United States, India, Brazil, Russia, Mexico, and Spain. The study found that after the emergence of the COVID-19 crisis the average stock market returns were negative in all five countries except Mexico, with Brazil having the highest volatility and the largest decline. The reasons for the different situations in different countries depended mainly on the different measures taken by the government. Fernandez-Perez et al. (2021)

investigated whether stock markets in countries with different cultures were affected differently by the COVID-19 crisis. The results showed that stock markets in countries with low individualistic behavior and high uncertainty avoidance tendencies reacted more negatively to the COVID-19 crisis. The level of democracy and political corruption also affected the cumulative abnormal stock market returns during the COVID-19 crisis.

There are a number of studies examining the impact of the COVID-19 crisis on the Chinese stock market. Liu et al. (2020) used event study methodology and found that the cumulative abnormal returns of the Chinese and Asian stock markets were negative in the ten trading days following the outbreak of the COVID-19 crisis. The author further analyzed the reaction of stocks in different sectors to the COVID-19 crisis and found positive cumulative returns in the medical manufacturing, software and IT sectors and negative cumulative returns in the transportation, food and beverage and accommodation sectors. Xu et al. (2022) used the ICSS model to find that the COVID-19 crisis had a significant impact on the volatility of the stock and bond markets, with the most pronounced impact in the period of severe outbreak. The COVID-19 crisis had a positive impact on stocks in the pharmaceutical and information sectors, and a significant and persistent negative impact on the financial and energy sectors. Nguyen et al. (2021) examined the impact of the COVID-19 crisis on more than 3,000 companies listed in China and found that the negative impact of the COVID-19 crisis on stocks lasted about 10 days. Moreover, stocks listed on the Shanghai Stock Exchange were more negatively affected by the epidemic than those listed on the Shenzhen Stock Exchange. Chen et al. (2021) examined the impact of the COVID-19 crisis on China's stock and bond markets. The study found that the COVID-19 crisis had a significant negative impact on the stock market, but a significant positive impact on the bond market. And the volatility of the stock market due to the COVID-19 crisis affected the bond market, but the volatility of the bond market did not affect the stock market.

2.3. Impact of government policies on stock markets during the COVID-19 crisis

The COVID-19 crisis has a negative impact on a country's economy. Stabilizing the economy is one of the government's main responsibilities, so the government releases policies much more frequently during this period than in other periods. Due to the increasing frequency of government policy announcements during the COVID-19 crisis, scholars have begun to pay attention to the impact of government policies on stock market prices.

Rubbaniy et al. (2020) found that the restrictive policies implemented by European governments to control the further spread of COVID-19 could not improve the impact of COVID-19 on the stock market. But some financial measures implemented by central banks could mitigate the negative impact of COVID-19 on European stock markets. Chen et al. (2020) studied the impact of the restrictive policies implemented by the US government on the stock returns of listed companies in the US tourism and leisure industry. The results showed that the stricter the restriction policy had a negative impact on the stock prices of these two industries, and

the relaxation of the restriction policy was conducive to the recovery of the company's stock prices. Zhang and Hamori (2021) focused on stock markets in the United States, Germany and Japan. The findings showed that government restrictions during the pandemic, such as restricting international travel, closing schools and shutting down unnecessary businesses, had a significant negative impact on both the economy and the stock market.

Dharani et al. (2022) studied the impact of lockdown policies of the Indian government on stock market returns during COVID-19 crisis and found that different lockdown stages had different impacts on stock market returns. The early blockade measures had a positive impact on the return rate of the stock market, and the late blockade measures had a negative impact on the stock market. Song et al. (2021) used the event study method to study the impact of Malaysian government's restrictive policies and incentives on stock market returns in 2020. The results showed that the restriction policy implemented by the Malaysian government in the early stage led to the decline of the stock market, but the restriction policy implemented in the later stage was conducive to the rise of the stock market price. The economic stimulus policy implemented by the Malaysian government was conducive to the rise of the company's stock price. Sinaga et al. (2022) took 11 sectors in the Indonesian stock market as research objects to study the impact of government policies during COVID-19. The results showed that Jakarta's first lockdown policy had a significant negative effect on stock market returns, while Jakarta's second lockdown policy had a slight negative effect on stock market prices. The economic stimulus policy had an obvious effect on the boost of stock prices.

Most scholars mainly focus on the impact of government policies in developed countries on the stock market. The research on developing countries mainly focuses on Southeast Asian countries, and the research on other developing countries is still insufficient.

3. Methodology and data

In this paper, China Securities Index 300 (CSI300) is selected as the research object. China Securities Index 300 consists of 300 stocks that are the largest and most liquid stocks in Shanghai Stock Exchange and Shenzhen Stock Exchange, which can reflect the performance of China's stock market more accurately. The data comes from CHOICE database and CSMAR database.

The event study method is commonly used in financial research to study the impact of events, so this paper adopts the event study method as the main research method. In this paper, the two restrictive policies implemented by the Chinese government to control the spread of the epidemic and the two stimulus policies used to stimulate the economy are selected as the events for the study. The cumulative abnormal returns (CARs) of stocks before and after the event window are calculated to analyze the impact of the government's policies on the stock prices during the epidemic. The restrictive policy dates are 23 January 2020 (the city of Wuhan implemented traffic control) and 27 March 2020 (Chinese government announced a ban on the entry of foreigners). The stimulus policy dates are 18 February 2020 (Chinese government announced the reduction of social security fees to be paid by

companies) and 3 April 2020 (Chinese government announced the reduction of rents for enterprises' business premises).

The formula for calculating the abnormal rate of return is as follows:

$$AR_{i,t} = R_{i,t} - \alpha_i - \beta_i R_{M,t} \quad (1)$$

$AR_{i,t}$ is the abnormal return of individual stocks. $R_{i,t}$ is the actual return of individual stocks. $R_{M,t}$ is the actual return of the market index. α_i and β_i are estimated parameters in the market index return model before the actual return of stocks regression event. Based on Krüger et al. (2015), this paper sets the 250 days to 50 days before the event as the estimation period. Since there is the possibility of information spillover before policy release and investors usually have insufficient or overreaction after the event, this paper calculates the cumulative abnormal return rate. In order to minimize the interference of other events, the window period of the research event is set as five trading days before and after the event.

In this paper, some representative company financial indicators are selected to further analyze the stock price response to events for companies with different financial profiles. Finally, these financial indicators are used to analyze the drivers of cumulative abnormal returns. Based on Rahman et al. (2021), this paper selects four financial indicators, Size, Leverage, Liquidity and Profitability to further analyze the impact of government policies on the average CAR of companies with different financial profiles. Since the government policies selected in this paper are all released in 2020, the financial data of the companies come from the annual reports of each company in 2019. Because the selected CSI 300 index consists of 300 stocks, this paper divides the 300 stocks into 3 groups based on the size of the financial indicators. Each indicator analyzes only a representative group of the top 100 and bottom 100. Largest and Smallest, High leverage and Low leverage, High liquidity and Low liquidity, and Most profitable and Least profitable are respectively the group consisting of the largest 100 stocks and the smallest 100 stocks in size, leverage, liquidity and profitable.

The empirical model of the drivers of cumulative abnormal returns is as follows:

$$CAR_i = \gamma_0 + \gamma_1 \text{SIZE} + \gamma_2 \text{ LEVERAGE} + \gamma_3 \text{ LIQUIDITY} + \gamma_4 \text{PROFITABILITY} + \varepsilon_i \quad (2)$$

CAR_i is the cumulative abnormal returns in different windows. SIZE is the logarithm of total assets. LEVERAGE is total liabilities divided by total assets. LIQUIDITY is cash and cash equivalents divided by total assets. PROFITABILITY is net income divided by total assets.

4. Results

4.1. Impact of government policies on CAR

Table 1 shows the average abnormal returns over the window period for the different events. Panel A shows the impact of the overall policy event. Panel B shows the impact of the restrictive policy event. Panel C shows the impact of the stimulative policy event. Each event is divided into a time window of 1 to 5 days before and after the event.

As shown in Panel A, the data of the average abnormal returns of all events are only insignificant for the [−1, 1] window period. Windows 2 to 5 are all positive at 0.382, 0.859, 0.883, and 0.621 respectively, which corresponds to being significant at

the 10%, 1%, 1%, and 10% levels. This shows that the policies implemented by the Chinese government during COVID-19 generally contributed to the increase in the company's stock price.

Secondly, observing the impact of restrictive policies implemented by the government on companies' stock prices. We can see that not all restrictive policies have negatively affected companies' stock prices. After the restrictive policy of sealing off the city of Wuhan, the average CAR of Chinese listed companies is positive and increases over time. The reason for this situation may be that the imposition of sealing control in Wuhan does not have a fundamental impact on the Chinese economy. Moreover, the closure of Wuhan has helped to control the further spread of the epidemic in China, and investors are taking this closure as a positive sign. But this does not mean that the imposition of restrictive policies by the Chinese government had a positive impact on the company's stock price, as can be seen from the second restrictive policy. The average CAR of the Chinese companies after the Chinese government enacted the restrictive policy of banning foreigners from entering the country are all negative at −1.033, −0.684, −0.883, −1.244, and −2.094. These values are all statistically significant. The negative impact of the policy of restricting the entry of foreigners on the company's stock price increases over time, starting from the second day after the implementation of the policy. The reason for this may be because China is a major export and tourism country, and banning foreigners from entering the country may affect China's tourism and export trade, which in turn affects the development of China's economy.

Finally, we observe the effect of government stimulus policies on the firm's stock price. As we can see from **Table 1**, all the stimulus policies when aggregated together are positive and significant at 0.818***, 0.591**, 1.059***, and 1.024***, respectively, except for the window period of [−5, 5]. The possible reason is that the two stimulus policies implemented by the Chinese government have generally succeeded in boosting investor confidence and contributing to the increase in the company's stock price. Further analysis shows that the effect of the policy to reduce company social security costs is not as significant as the boost from the policy to reduce company rents within three days of the policy's release. However, the positive impact of the policy to reduce company social security costs on companies starts to rise gradually from the second day, and the effect is significantly stronger than that of the policy to reduce rents for companies in four to five days. The positive effect of the policy of reducing company social security costs on stock market prices is more persistent than that of the policy of reducing company rents.

According to the theory of the efficient market hypothesis, the impact of government policies is quickly reflected in stock prices and the average CAR of stocks should not change significantly after the event. However, as seen through the data above, the magnitude of the average CAR is higher in the longer windows compared to the [−1, 1] and [−2, 2] windows. This shows that investors generally do not reflect government policies in a timely manner and often need more than two days to make corresponding investment decisions. This further validates the theory of behavioral economics.

Table 1. Average cumulative abnormal returns (%).

Window	**[−1, 1]**	**[−2, 2]**	**[−3, 3]**	**[−4, 4]**	**[−5, 5]**
Panel A: All policies					
All policies	0.206	0.382	0.859	0.883	0.621
	(1.516)	(2.103*)	(3.833***)	(3.323***)	(2.028*)
Panel B: Restrictive policy					
All Restrictive policies	−0.407	0.173	0.659	0.741	0.707
	(−1.932*)	(0.585)	(1.757)	(1.703)	(1.414)
1st Restrictive policy	0.224	1.037	2.211	2.740	3.528
	(0.695)	(2.161*)	(3.470***)	(3.566***)	(4.187***)
2nd Restrictive policy	−1.033	−0.684	−0.883	−1.244	−2.094
	(−3.882***)	(−2.014*)	(−2.350*)	(−3.299***)	(−4.305***)
Panel C: Stimulus policy					
All stimulus policies	0.818	0.591	1.059	1.024	0.536
	(4.859***)	(2.795**)	(4.304***)	(3.354***)	(1.508)
1st stimulus policy	0.770	0.101	0.899	2.364	2.019
	(2.837**)	(0.315)	(2.317*)	(4.524***)	(3.496***)
2nd stimulus policy	0.866	1.079	1.217	−0.312	−0.942
	(4.326***)	(3.938***)	(4.019***)	(−1.052)	(−2.380*)

Note: *, **, *** denote statistical significance at the 10%, 5% and 1% level, respectively.

4.2. Impact of government policies on CAR of firms with different financial positions

This paper further analyzes the effect of firm characteristics on CAR. As can be seen in **Table 2**, the average CAR of companies with more assets is negative and statistically significant in the [−5, 5] window period. The average CAR of companies with higher assets is also negative in the statistically significant data in the [−1, 1] and [−3, 3] windows. This shows that whether the government implements restrictive or stimulative policies, they have a negative impact on companies with higher assets. Moreover, the values in the [−3, 3] and [−5, 5] windows are smaller than those in the [−1, 1] window, which shows that the negative impact of government policies on the stock prices of large companies is elevated with time. In contrast, the effect of the policy on the abnormal returns of small companies is opposite to that of large companies. The average abnormal returns of small companies are positive in all stimulus policies, and government stimulus policies have a significant positive impact on the stock prices of small companies. The second restrictive policy has a negative impact on the stock price of small companies. However, the first restrictive policy has a significant positive impact on the stock price of small companies and shows a positive trend of increasing, the average CAR of small companies are 1.422*, 7.493*** and 12.129*** respectively. This shows that government policies generally lead to a decrease in the stock price of large companies but favor an increase in the stock price of small companies, which is also in line with the results of Panel A's average CAR.

Second, looking at the performance of companies with different levels of

leverage in Panel A. The cumulative abnormal returns for highly leveraged companies are −0.252, −0.923** and −1.401***, while those for low leveraged companies are 0.555*, 2.307*** and 2.858**. This shows that the stock prices of highly leveraged companies are generally negatively affected by government policies and low leveraged companies are positively affected. And the impact of policies on both different leveraged companies increases with time. Looking at the data for restrictive and stimulus policies shows that the data combining all restrictive policies and the data combining all stimulus policies are also consistent with this finding. This shows that after the implementation of government policies, the stock prices of low-leveraged companies significantly outperform those of high-leveraged companies.

Third, observe the performance of companies with different liquidity in different government policies. From Panel A of all policies, it can be seen that the average CAR of highly liquid companies in windows 1, 3, and 5 of which are 0.671**, 1.350***, and 1.697**, respectively. The policy in general has a positive impact on highly liquid companies and a negative impact on low liquidity companies but the data is not statistically significant. Looking at the statistically significant data from the stimulus policies, the stimulus policies positively affect the stock prices of both highly liquid and lowly liquid companies. In terms of restriction policies, the stock prices of the low liquidity companies are negatively affected by both restriction policies, and the high liquidity companies are positively affected by both the first and all restrictive policies. It can be seen that high liquidity companies are more risk resistant than low liquidity companies.

The final observation is the performance of companies with different levels of profitability. In both the data for all policies aggregated and for individual policies, government policies have a positive effect on highly profitable companies in statistically significant results. The average CAR for low profitability companies is negative in all government restrictive policies. This shows that all restrictive policies have a negative effect on low profitability companies. And although the stock price of low profitability companies has positive response in the first stimulus policy, the response in the second stimulus policy is negative. This shows that the government's stimulus policies also do not have a good effect on the low profitability companies. Through the above analysis, it is found that the risk resistance of high profitability companies is higher than that of low profitability companies. In terms of the effect of the stimulus policy, the effect of high profitability companies is also better than that of low profitability companies.

Table 2. Average cumulative abnormal returns (%) of characteristic-sorted portfolios.

	Size				**Leverage**				**Liquidity**				**Profitability**		
Window	**[−1, 1]**	**[−3, 3]**	**[−5, 5]**		**[−1, 1]**	**[−3, 3]**	**[−5, 5]**		**[−1, 1]**	**[−3, 3]**	**[−5, 5]**		**[−1, 1]**	**[−3, 3]**	**[−5, 5]**
Panel A: All policies															
All policies															
Largest	−0.305*	−1.354***	−1.818***	High leverage	−0.252	−0.923**	−1.401***	High liquidity	0.671**	1.350***	1.697**	Most profitable	0.384	2.115***	2.241***
Smallest	0.820**	2.863***	3.027***	Low leverage	0.555*	2.307***	2.858**	Low liquidity	−0.189	−0.010	−0.489	Least profitable	−0.229	−0.549	−1.164**
Panel B: Restrictive policy															
All Restrictive policies															
Largest	−0.074	−1.580***	−2.219***	High leverage	−0.210	−1.430**	−1.912**	High liquidity	0.335	1.597*	2.829**	Most profitable	−0.304	2.186**	2.977**
Smallest	−0.415	3.161***	4.360***	Low leverage	−0.516	2.111**	3.614***	Low liquidity	−1.077**	−0.870	−1.133	Least profitable	−0.791*	−1.474**	−2.227**
1st Restrictive policy															
Largest	−0.671	−2.311**	−2.972**	High leverage	−0.094	−0.876	−0.796	High liquidity	1.406**	4.109***	7.415***	Most profitable	0.458	3.612**	5.190***
Smallest	1.422*	7.493***	12.129***	Low leverage	0.595	4.392***	7.839***	Low liquidity	−0.644	−0.086	−0.029	Least profitable	−0.507	−0.527	−0.316
2nd Restrictive policy															
Largest	0.517	−0.857**	−1.474**	High leverage	−0.325	−1.978***	−3.015***	High liquidity	−0.736	−0.916	−1.757	Most profitable	−1.066*	0.760	0.765
Smallest	−2.229**	−1.119	−3.317**	Low leverage	−1.613**	−0.145	−0.563	Low liquidity	−1.511***	−1.653**	−2.237**	Least profitable	−1.073**	−2.401**	−4.117***
Panel C: Stimulus policy															
All stimulus policies															
Largest	−0.537***	−1.128**	−1.417***	High leverage	−0.294	−0.418	−0.891	High liquidity	1.008***	1.103*	0.565	Most profitable	1.072***	2.045***	1.505*
Smallest	2.048***	2.566***	1.702*	Low leverage	1.620***	2.502***	2.106**	Low liquidity	0.699**	0.849*	0.156	Least profitable	0.333	0.377	−0.101
1st stimulus policy															
Largest	0.252	0.011	−1.338*	High leverage	0.302	0.899*	0.741	High liquidity	0.772	0.716	2.275**	Most profitable	0.403	0.620	1.961
Smallest	1.481*	1.422	4.767***	Low leverage	0.927	1.028	3.761**	Low liquidity	0.753*	0.761	1.113	Least profitable	1.174*	1.275*	1.909*
2nd stimulus policy															
Largest	−1.316***	−2.255***	−1.496***	High leverage	−0.883***	−1.718***	−2.506**	High liquidity	1.244**	1.490**	−1.144	Most profitable	1.741***	3.470***	1.049
Smallest	2.614***	3.711***	−1.363	Low leverage	2.313***	3.976***	0.450	Low liquidity	0.646	0.937	−0.802	Least profitable	−0.499	−0.512	−2.088**

4.3. Analysis of the drivers of CAR

This chapter studies the drivers of CAR under different policies. Where CAR data is selected for the [−5,5] window period. Model 1 analyzes the effect of Size on CAR. Model 2 analyzes the effect of Leverage on CAR. Model 3 analyzes the effect of Liquidity on CAR. Model 4 analyzes the effect of Profitability on CAR. Model 5 analyzes the effect of the combination of the four factors Size, Leverage, Liquidity and Profitability on CAR.

As shown in **Table 3**, Model 1 shows that Size is negative for all three events, −0.020, −0.028, and −0.017, respectively, which are all significant at the 1% level. This shows that the larger the market capitalization, the smaller the CAR of the firm, regardless of whether the government implements stimulus or restriction policies. Model 2 shows that Leverage is negative for all three events, −0.060, −0.089 and −0.030, respectively, and are significant at the 1%, 1% and 10% levels. This indicates that the larger the Leverage, the smaller the CAR for the companies, whether the government implements stimulus or restrictive policies. Model 3 shows that liquidity is positive for all three events, but only the values of the first two events are statistically significant. This indicates that when the government implements all policies or restrictive policies, the larger the Liquidity, the larger the CAR of the firm. This is consistent with the conclusions drawn in **Table 2**. And it was found that Size is an important driving factor for abnormal returns.

Table 3. Determinants of cumulative abnormal returns.

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Panel A: All policies					
Constant	0.248***	0.038***	−0.008	0.004	0.205***
Size	−0.022***				−0.018***
Leverage		−0.060***			−0.012
Liquidity			0.096***		0.049
Profitability				0.031	−0.011
R squared	0.039	0.021	0.013	0.002	0.042
Panel B: Restrictive policies					
Constant	0.308***	0.055***	−0.017*	0.003	0.210**
Size	−0.028***				−0.019*
Leverage		−0.089***			−0.023
Liquidity			0.159***		0.097*
Profitability				0.077*	0.014
R squared	0.046	0.036	0.028	0.009	0.059
Panel C: Stimulus policies					
Constant	0.188***	0.022**	0.001	0.006	0.200***
Size	−0.017***				−0.018**
Leverage		−0.030*			−0.001
Liquidity			0.033		0.001
Profitability				−0.015	−0.036
R squared	0.033	0.008	0.002	0.001	0.037

Note: *, **, *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Next, Model 5 is further analyzed. When examining all government policies, regression Models 1 to 4 show that Size, Leverage and Liquidity are significant. However, in Model 5, where all financial indicators are combined, only Size is statistically significant, indicating that the explanatory power of Leverage and Liquidity in Panel A comes from Size. When studying all restrictive policies of the government, size, leverage, liquidity, and profitability have statistical significance in each model, but only size and liquidity have statistical significance in Model 5. This shows that the explanatory power of Leverage and Profitability comes from Size and Liquidity in Panel B. Size and Leverage are statistically significant in the separate models, but only Size is statistically significant in Model 5 when examining total government stimulus policies. This shows that the explanatory power of Leverage in Panel C comes from Size. From the above analysis, it can be seen that Size is an important driving factor for CAR.

5. Conclusion

This paper focuses on the impact of restrictive and stimulative policies implemented by the government during the COVID-19 crisis on stock returns. The empirical result finds that not all restrictive policies caused stock market prices to fall. The government's announcement of the Wuhan closure policy not only caused the stock market to rise, but even rose more than the stock market decline caused by the government's restrictive policy of banning foreigners from entering the country. Investors holding high asset, high leverage and low profitability companies were more significantly negatively impacted after the restrictions were implemented. The subsequent stimulus policies issued by the Chinese government have worked well and have had an overall positive impact on the Chinese stock market. However, subsequent analysis reveals that the stimulus policies did not have a positive impact on the stock prices of all companies. The policy implemented by the government to reduce company social security costs was highly effective and had a positive effect on the stock prices of all companies in all financial situations. However, the government's announcement of a stimulus policy to reduce rents for small companies will instead have a negative impact on high-asset companies, highly leveraged companies, and companies with lower earnings. This shows that the stimulus effect of lowering social security for companies is stronger than the effect of lowering rents for small companies. And after the implementation of the stimulus policy, investors holding high-asset and high-leverage companies will suffer significant losses, while investors holding low-asset, low-leverage and high-profitability companies will have significant profits.

If similar public health events occur in the future, investors should adjust their portfolios in a timely manner according to government policies. After the restrictive policies issued by the Chinese government during the crisis, investors should avoid holding on to companies with high assets, high leverage and low profits. Not all stock prices will rise after the government's stimulus policies, and investors should adjust their portfolios in time. Following the release of stimulus policies, investors should replace high-asset and high-leverage companies in their portfolios with low-asset, low-leverage and high-profitability companies. This helps investors to avoid asset losses

while also achieving asset appreciation. Investors should adjust their portfolios within two days of the government's policy announcement, or they could face even bigger losses.

Although some of the government's restrictive policies may cause a company's stock price to fall, not all of them will cause a company's stock price to fall. Governments should pay attention to the strength of their restrictive policies, so that they can achieve their policy objectives while minimizing the damage to investors' interests. When formulating restrictive policies, the government should try its best to reduce the impact of such policies on China's tourism and imports and exports, otherwise it will have a significant negative impact on the stock market. The results of government stimulus policies implemented during the COVID-19 crisis show that government policies favorable to all companies can lead to a good recovery in stock market prices. Targeted policies can increase the stock prices of companies that benefit, but cause the stock prices of companies that do not benefit to fall. When faced with similar crisis events in the future, the government should focus on formulating policies that are beneficial to all companies in the early stage. After the stock market price is stable, the corresponding policies for different types of companies will make the stock market price recover better.

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