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Determining the Impact of Lifting Lockdown on the Operations of a Multinational Company based on the Double Difference Model

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Abstract

As transnational operations have become an international trend, the operation and development of my country's multinational enterprises have played an increasingly important role in this trend. In the past, people's research on the factors affecting transnational operations was mostly theoretical analysis of exchange rate fluctuations and policies such as the "Belt and Road Initiative", which limited the research vision and ignored some policies that would have a greater impact on operations. Theoretical analysis alone often falls into the trap of talking on paper. For this reason, this paper uses a double difference model to study the impact of my country's "full lifting of lockdown" policy on the stock price of foreign multinational companies in 2022. It is proposed that companies should have forward-looking expectations for their own development in future trends and formulate reasonable marketing policies in advance. Scholars should combine qualitative and quantitative analysis to conduct detailed research on the impact of different policies in different industries.

Keywords

Double Difference Model; Company A; Transnational Operations; Political Risk.

1. Introduction

1.1. Research Background and Significance

Since the reform and opening up, transnational operations, especially foreign companies entering China, have become a trend in this period. However, leaving the local area to operate in a new country or region will not only face economic or market risks, but also political risks to a certain extent. Political risk refers to the uncertainty brought to the economic interests of foreign-invested enterprises due to changes in the political environment of the host country or the political relations between the host country and other countries. Especially in recent years, the world is undergoing a major change that has not been seen in a century, and many political factors are in a state of uncertainty, which places great demands on the survival of enterprises in this environment. In the face of these uncertain factors, we can only respond promptly and sensitively when they come by chance, but for some foreseeable political risk factors, we need to be fully prepared before the political factors occur.

Chinese multinational companies have become key micro-subjects participating in global economic development and have played a huge role in the development of China's national economy. With the development of the Chinese market, the scale of Chinese multinational companies has gradually expanded and their international influence has continued to increase. At the same time, due to the continued smoke of international trade frictions, Brexit and the emergence of unilateralism, the international environment in which Chinese multinational companies are developing has become increasingly complex, and the operating conditions of Chinese multinational companies in the international market have also attracted much attention.

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However, it is undeniable that the time for Chinese enterprises to operate across borders is relatively short compared to the time for foreign enterprises to enter China. Therefore, this paper takes the famous company A as an example to construct a research framework for the impact of comprehensive lifting of risk control on corporate stock prices. Through the double difference model, the paper conducts analysis, quantitatively judges the policy effect of comprehensive lifting of risk control on Company A, and draws reliable conclusions.

1.2. Research Content

In the first part, a general introduction is made to the research of this paper, including the significance of the topic, content and methods, etc. Finally, the possible contributions and shortcomings of this paper are summarized.

In the second part, according to the research direction of this paper, relevant research materials are consulted and reviewed, the existing literature is summarized, and the viewpoints of this paper are put forward.

In the third part, a double difference model is constructed, and the research methods and various indicators are selected. The model settings are used to explain the empirical results, analyze, evaluate its policy effects and conduct robustness tests to ensure the reliability of the results.

In the fourth part, the paper summarizes and draws conclusions, analyzes the shortcomings, looks forward to the future, and continues to study and improve the direction.

1.3. Literature Review

From the mid-20th century to the 1990s, the core indicator of the overseas operating performance of multinational companies was the return on investment (ROI). With the acceleration of globalization, a single financial indicator can no longer fully reflect the overall economic situation of multinational companies. The evaluation of multinational business performance often combines financial information with non-financial information. According to Radulovich (2008)[1], the internationalization performance of an enterprise refers to the financial and non-financial benefits obtained by the enterprise from its international operations. Yang Xinfang and Ren Lijun (2008)[2] believe that the multinational business performance of an enterprise includes asset performance, personnel performance, operational performance, brand performance and development performance. Zhao Zhuang (2017)[3] believes that internationalization performance refers to the income generated by the investment in the international market during the internationalization process of an enterprise. It is part of the enterprise's operating performance. From the company's financial statements, it can be seen to what extent the economic activities carried out by the enterprise abroad have promoted the overall benefits of the enterprise. Zhang Haibo and Li Yanzhe (2020)[4] borrowed the research method of Dossi Hollender and used the average growth rate of main business ASG as an indicator to measure the operating performance of overseas subsidiaries. However, as far as current corporate operations are concerned, stock market fluctuations are more important. Therefore, this article uses the stock price of AB Company as a measurement indicator.

In the early research on the political risk analysis of transnational operations, the focus was mainly on the impact of national exchange rate fluctuations on the operations of transnational enterprises. Liu Baohong (1994)[6] based on the current situation of RMB depreciation at that time, explored the detailed analysis of the impact of exchange rate fluctuations on the financial, production and marketing decisions of transnational enterprises. Chu Xiao (2018)[7] used probit and logit models to analyze the impact of exchange rate fluctuations on transnational operations of enterprises. Cao Tingting (2022)[8] used a double difference model to explore the impact of the "Belt and Road" policy on international logistics performance eight years after the policy was proposed.

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2. Model Establishment

2.1. Data Source

This paper selects two multinational companies in Baidu Stock Market from 2022 to 2023 as research samples, and collects and matches the data of relevant variables for each multinational company in two years. Company A entered the Chinese market in 1988 and has developed steadily in the Chinese market. Its brand products are well-known in China. In 2019, China contributed 1/3 of its revenue growth. Therefore, China's policy changes, especially the situation in the previous three years, should have an impact on it. Company B has not yet entered the domestic market, so the domestic lifting of risk control policies has an impact on company a, but not on company b. The data selected in this paper are the stock prices of the two companies on Baidu Stock Market from 90 days before to 70 days after the lifting of the risk control policy. Baidu Stock Market is a stock APP that uses big data engine technology to intelligently analyze stock market hotspots. Through Baidu Stock Market, you can view the real-time market conditions of the global financial market; realize multi-market and multi-variety self-selected stock lists, create A-shares, Hong Kong stocks, US stocks and fund details that can be synchronized in real time between various terminals; obtain customized information based on self-selected stocks and provide 7*24 hours real-time account opening functions for multiple brokers. Therefore, for the stock prices of multinational companies, it has a certain typicality and representativeness.

2.2. DID Model

2.2.1. Double Difference Model

The double difference model uses observed data to simulate experiments. The basic idea is to divide the survey samples into two groups: one group is the policy-affected group, that is, the experimental group, and the other group is the policy-unaffected group, that is, the control group (control variable method).

First, calculate the change in a certain indicator of the experimental group before and after the policy, and then calculate the change in the same indicator of the control group before and after the policy, and then calculate the difference between the above two variables to reflect the net impact of the policy.

The double difference model is a common policy effect evaluation model.

2.2.2. DID Model Construction

$Yit=\alpha+\beta(Treati\times Postt)+\omega it+\mu i+\lambda t+\mu it$

Where i represents the company and t represents time.

Yit is the stock price of company i at time t, where company A, which is affected by the country's policy of lifting the lockdown, is set as the experimental group, and company B, which is not affected by the policy, is set as the control group.

β is the average treatment effect.

Treati is a dummy variable for the treatment period, with 0 for company B in the control group and 1 for company A in the treatment group.

Postt is a dummy variable for the treatment period, which takes 1 after the "full lifting of lockdown" policy takes effect and 0 before the "full lifting of lockdown" policy takes effect.

ωit is a control variable that changes over time and individuals, including the impact of changes in the country's economic policies, the internal structure of the company, governance, etc.

μi is an individual fixed effect, λt is a time fixed effect, and μit is a model error term.

$\beta=[E(yit|\ treati=1, Postt=1)- E(yit|\ treati=1, Postt=0)]$

$-[E(yit|\ treati=0, Postt=1)- E(yit|\ treati=0, Postt=0)]$

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=(Y(1)-Y(0))-(C(1)-C(0))
=(β+λt)-λt
=(β+μi)-μi
The cross-product term coefficient β is the treatment effect, which in the above formula is the difference between the before-and-after change of the treatment group and the before-and-after change of the control group.

3. Model Results

3.1. Regression Results

Using stata software, a difference-in-difference model with double fixed effects of time policy was selected for regression estimation. The estimation results of the impact of the "comprehensive lifting of blockade" policy on multinational enterprise A are shown in Figure 1. As can be seen from the regression results in the figure, both the p-value of did and the p-value of the constant term are less than 0.01, so the regression is significant at the 99% level. Therefore, in general, the "comprehensive lifting of blockade" policy has a significant effect on multinational enterprise A. Since the did regression coefficient in the figure is negative, it can be seen that this policy has a significant inhibitory effect on Company A.

```
. reg SP did
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Source	SS	df	MS	Number of obs	=	326
				F(1, 324)	=	53.39
Model	157236.309	1	157236.309	Prob > F	=	0.0000
Residual	954252.565	324	2945.22397	R-squared	=	0.1415
				Adj R-squared	=	0.1388
Total	1111488.87	325	3419.96577	Root MSE	=	54.27

SP	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
did	-26.35803	3.607412	-7.31	0.000	-33.45494	-19.26112
_cons	105.0971	4.214702	24.94	0.000	96.80549	113.3888

Figure 1. Estimated results of the impact of the “full lifting of lockdown” policy on multinational company A

3.2. Robustness Test

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. reg SP time treat did,r

Linear regression                               Number of obs     =        326
                                                F(3, 322)         =   15986.63
                                                Prob > F          =     0.0000
                                                R-squared         =     0.9917
                                                Root MSE          =     5.3414
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SP	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
time	7.326102	.3838992	19.08	0.000	6.570835	8.081369
treat	117.1429	.9161752	127.86	0.000	115.3405	118.9454
did	-2.235489	1.150538	-1.94	0.053	-4.49901	.0280324
_cons	22.11944	.2244047	98.57	0.000	21.67795	22.56092

Figure 2. Results of robustness test on the estimated impact of the “full lifting of lockdown” policy on multinational company A

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The robust command in stata software was used to perform a robustness test on each regression, and the obtained treat and post interaction coefficients β and p-values are shown in Figure 2. The overall interaction coefficient is -2.2354, and the test p-value is 0.053, which is less than 0.01. Therefore, the overall test is robust at the 99% level.

4. Conclusion, Suggestions and Outlook

The above double difference results show that the "full lifting of lockdown" policy has indeed had a significant impact on the operation of the old multinational company A, but this policy is not unforeseeable, so Chinese companies should pay special attention when operating in a multinational company. Because the current international situation in many countries is relatively tense, there may be a comprehensive or partial lockdown and lifting policy due to factors such as war and plague. After analysis, this policy will indeed have a visible impact on the operation of multinational companies. Companies need to be foreseeable about the impact of this policy and prepare marketing plans and business strategies in advance.

This paper quantitatively analyzes the impact of the "full lifting of lockdown" policy on Company A based on the double difference model, but the rationalization of qualitative analysis should not be ignored. The "full lifting of lockdown" policy has indeed had a significant impact on the operation of Company A, a long-established multinational daily chemical products company, and this paper does not give a specific analysis of whether this policy has an impact or an effect on companies in other industries. Therefore, in the future, both companies and scholars should combine qualitative and quantitative analysis, and conduct detailed research on the impact of different policies in different industries, so as to put forward targeted suggestions for the development of multinational operations in the industry.

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