

ANNOUNCEMENT REACTION OF CORPORATE AND GOVERNMENT ALLIANCES: AN EMPIRICAL STUDY BASED ON EVENT RESEARCH

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ABSTRACT: *This paper adopts the event research method, taking samples of a total of 87 government investment alliance announcements issued by the GEM listed companies in 2011-2016, and explores the announcement reaction of corporate and government alliances. The empirical results show that the cumulative abnormal return (CAR) is positive from -4 to 4 and always keeps increasing, and the government alliance announcement has a positive market reaction. And it rose greatly on the day before the announcement day, and the government strategic alliance announcement information may be leaked in advance. The results of multiple linear regression show that the indicators such as Tobin's Q value, equity cash flow, and common stock return rate are positively related with the cumulative abnormal return (CAR), and the statistical results are significant, all of which are related to the indicators such as stock return rate and enterprise investment value, which also indicates that investors in China's current stock market are still focused on short-term speculation.*

KEYWORDS: Government-Enterprise Alliance, Announcement Reaction, Event Research Method

INTRODUCTION

Cooperation between government and enterprises is a new model of cooperation in China. This new model of cooperative alliance is helpful to the deep integration of technological innovation achievements and market-driven demand, and to improve the conversion rate of scientific and technological achievements, and to promote the close development of science and technology and economic society (Jiang Xun et al.,2015). Major cities in China have promoted the cooperation model of government and enterprise. For example, Jinan City has promoted the close cooperation between government and enterprise continuously and achieved extraordinary results: the dominating position of enterprises is forming, and the conversion rate of scientific and technological achievements is increasing (Liu Yunying & Liu Xin,2006). In recent years, Hefei City has vigorously introduced BOE and its supporting upstream and downstream enterprises, and set up many major R&D centers. However, many literature researches focus on the specific long-term effects and achievements of government and enterprise cooperation. For example, Zhuang Tao et al. (2013) shows that enterprises are the most active innovation entities based on the 2002-2011 patent data research results, actively seeking cooperation to realize the transformation of patent achievements, but the participation degree of the government departments is relatively low. Wang Peng et al. (2013) examine the impact of the

government and enterprise cooperation on new products and patents based on the economic data of 13 provinces and cities in China from 2001 to 2010. The results show that the impact of government and enterprise cooperation in promoting the two types of innovation output is not obvious. There is rare literature on the short-term impact of government and enterprise cooperation, that is to say the short-term market reaction after the announcement of the company's release about its cooperation alliance with government. This paper adopts the event research method to take the sample of a total of 87 government cooperation alliance announcements issued by the GEM listed companies in 2011-2016, to explore the short-term market reaction of the cooperation between the government and enterprise alliances.

THEORY ANALYSIS AND HYPOTHESIS

Event Research Method

The event research method is a joint term for a series of methods used to measure the impact of an event on the price of a financial asset (Guo Jiabao,2013). It can be used to investigate the impact of unexpected events on stock prices, and to evaluate the reaction efficiency of stock market to market access to conclude whether the stock market has reached a semi-strong validity status (Deng Hanzhang,2013). The event research method usually includes the steps of defining events and corresponding window events, selecting appropriate samples, measuring normal returns and abnormal returns, testing abnormal returns, and empirical results analysis (Kang Hong,2005).

The Effective Market Hypothesis

The effectiveness of the event research method relies on the effectiveness of the market. Many developed countries such as European and American countries' securities markets have reached a weak-effective, and semi-strong effective status. Therefore, this method is mostly used in mature securities markets in Europe and the United States. The efficient market hypothesis is divided into three levels: weak effective market, semi-strong effective market and strong effective market(Li Dan,2018).Narayan (2007) evaluated the stock markets of the United States, Canada, the United Kingdom, France, Germany, Japan, Italy and other countries, and he believed that the G7 countries stock market has reached a strong and efficient market status, that is to say, the current stock price already includes all the stock price relevant information, there is no information can be used to obtain further returns. However, China's stock market started late and the market system is not complete and mature. Most scholars believe that China's securities market is in a weak and effective market status (Tang Yuting,2013). Chen Hong (2011) conducted correlation and run test on Shanghai and Shenzhen stock markets. The results show that China's stock market has reached a weak and effective status, but it has not reached the semi-strong effect status. Luo Jiahui and others (2016) test the market effectiveness with the sequence correlation test and event research method. The results show that the Shanghai A-share market has achieved weak effective status, but there is still a certain gap between the semi-strong and effective status. That is, the use of the relevant

historical information included in the current stock price cannot obtain excess returns, and must seek information other than historical price information to obtain excess returns. Based on these, the following hypothesis is proposed:

H1: The government's strategic cooperation announcement information has been leaked in advance, and the cumulative abnormal return has increased significantly before the announcement day.

Theoretical Analysis of Strategic Cooperation between Enterprises and Government

The strategic cooperation between enterprises and the government is mainly for the following purposes.

Expand the access to obtain competitive intelligence. If the enterprises only rely on strategic alliances between enterprises, it's not enough to adapt to fierce market competition. They need to cooperate with the government to collect, process, analyze and process competitive intelligence (Cao Ruzhong et al.,2014); policy guidance, and obtain the related funds support of local industrial development planning provided by the government (Qian Jiming,2007); through scientific and technological innovation, boost the local education research and development transmission into scientific and technological achievements, and through industrial policies to help enterprises commercialize scientific and technological achievements (Jiang Xun et al,2015); the labor cost, land and other factors cost in the eastern coastal cities increase rapidly (Yang Yaping & Zhou Yonghong,2013), in order to reduce costs, enterprise begin to set up factories or R&D centers in central and western cities where labor and land costs are relatively low.

Regardless of which purpose, the above mentioned is a strategic consideration for long-term development, which is conducive to the enterprise expansion in aspect of scale and performance, thereby increasing the investment value of stocks. Therefore, when enterprises announce strategic cooperation with the government, the following indicators usually have a greater impact on investors:

Company scale. The larger the company scale is, the more stable company operation will be, the higher attention the company will obtain, and the relatively transparent is in information; on the contrary, the smaller the company is, the more serious information asymmetry and moral hazard problems are, and the lower market attention is obtained (Feng Ya,2013). Based on these, the following hypothesis is made:

H2: The company size is positively correlated with the cumulative abnormal return, that is, the larger the company size is, the higher the cumulative abnormal return will be, and vice versa.

Asset-liability ratio. Asset-liability ratio = total liabilities / total assets. Enterprises with relatively low asset-liability ratios generally have a healthier operation, the possibilities of financial risks are lower, the investment risk is lower and the investment value is relatively higher. Based on these, the following hypothesis is proposed:

H3: The asset-liability ratio is negatively correlated with the cumulative abnormal return. That is, the higher the asset-liability ratio is, the lower the cumulative abnormal return will be, and vice versa.

Tobin's Q value. The Tobin's Q value is the ratio of the market value of an asset to its recharge cost, which can be used to measure whether the market value of a listed company is overestimated or underestimated. For stocks with high Tobin's Q value, the market value is higher than the book value, which indicates that the market is optimistic about the future expectation of the company, this will drive the stock price to rise; if the Tobin's Q value is lower, the market value of the stock is lower than the book value, the market for the company future expectations are not good, which will lead to a fall in stock prices (Shi Rongrong,2016). Based on these, the following hypothesis is proposed:

H4: The Tobin's Q value is positively correlated with the cumulative abnormal return. That is, the higher the Tobin's Q value is, the higher the cumulative abnormal return will be, and vice versa.

Equity cash flow. Equity cash flow is the cash flow that an enterprise can provide to shareholders in a given period of time. The higher the indicator is, the higher probability that the stock will receive cash dividends will be, and the higher the return on investment will be. Based on these, the following hypothesis is made:

H5: The equity cash flow is positively correlated with the cumulative abnormal return. That is, the higher the equity cash flow is, the higher the cumulative abnormal return will be, and vice versa.

Common stock interest rates. The common stock interest rate is the percentage of dividends per share and the market price per security. This indicator directly reflects the return on investment of the stock. The higher the interest rate of common stock is, the higher the return on investment will be, the more investment value the stock has. Based on these, the following hypothesis is made:

H6: The return on common stock is positively correlated with the cumulative abnormal return. That is, the higher the return rate of common stock is, the higher the cumulative abnormal return will be, and vice versa.

The proportion of the top ten shareholders. The higher the shareholding ratio of the top ten shareholders is, the higher the concentration of ownership will be, the decision of the major shareholders on the enterprise is decisive, the minority shareholders voice will be weaker, the insufficient understanding of the information of the enterprise, and investment in the stock is relatively cautious. Based on these, the following hypothesis is proposed:

H7: The top ten shareholders' shareholding ratio is negatively correlated with the cumulative abnormal return. That is, the higher the shareholding ratio of the top ten shareholders is, the lower the cumulative abnormal return will be, and vice versa.

DESCRIPTIVE STATISTICS**Data source and sample selection**

This paper selects the data of the GEM listed companies in 2011-2016, the information sources and the information of the alliance announcement time and content, the daily stock return rate, the daily market return rate (GEM), and the financial data and governance structure of the company all are from CSMAR. There is a total of 87 announcements data about government alliances. The following is the detailed data of the company and time announced by the government alliance announcement.

Table 1. Research sample of market reaction of government alliance announcement

Year	Company name	Stock code	The announcement date
2014	Tgood	300001	2014/9/16
2014	Tgood	300001	2014/12/24
2014	Tgood	300001	2014/12/25
2015	Lanxum	300010	2015/2/2
2015	Dinghan Technology	300011	2015/2/14
2014	Enjoyor	300020	2014/4/8
2014	Enjoyor	300020	2014/4/11
2014	Enjoyor	300020	2014/7/1
2014	Enjoyor	300020	2014/8/20
2014	Enjoyor	300020	2014/8/22
2014	Enjoyor	300020	2014/9/17
2014	Enjoyor	300020	2014/10/21
2014	Enjoyor	300020	2014/10/27
2014	Enjoyor	300020	2014/11/6
2014	Enjoyor	300020	2014/11/20
2014	Enjoyor	300020	2014/11/21
2014	Enjoyor	300020	2014/11/25
2014	Enjoyor	300020	2014/12/5
2015	Enjoyor	300020	2015/2/16
2015	Enjoyor	300020	2015/5/12
2015	Enjoyor	300020	2015/5/20
2015	Enjoyor	300020	2015/6/11
2015	Enjoyor	300020	2015/7/31
2015	Enjoyor	300020	2015/7/31
2015	Enjoyor	300020	2015/11/20
2016	Dayu Water-saving	300021	2016/11/10
2016	Jiuzhou Electric	300040	2016/12/26
2015	Sunwin Intelligent	300044	2015/11/24
2016	ZQGAME	300052	2016/8/22

2016	Savings	300056	2016/5/30
2015	Originwater	300070	2015/7/10
2015	Egova	300075	2015/3/3
2016	Shengyun	300090	2016/8/26
2011	YLZ	300096	2011/9/7
2015	Sailhero Environmental Protection	300137	2015/10/25
2015	Walvax Biotechnology	300142	2015/7/29
2016	Songcheng	300144	2016/4/27
2016	Sotech	300173	2016/9/27
2014	SHENNONG GENE	300189	2014/2/19
2015	SHENNONG GENE	300189	2015/2/10
2015	SHENNONG GENE	300189	2015/4/14
2015	SHENNONG GENE	300189	2015/6/9
2015	SHENNONG GENE	300189	2015/6/17
2015	SHENNONG GENE	300189	2015/7/2
2016	SHENNONG GENE	300189	2016/2/1
2013	Techand Ecology and Environment	300197	2013/11/1
2014	Techand Ecology and Environment	300197	2014/1/6
2016	Techand Ecology and Environment	300197	2016/2/25
2016	Techand Ecology and Environment	300197	2016/2/25
2014	Newchoice	300198	2014/7/30
2015	Focused Photonics	300203	2015/2/9
2015	Focused Photonics	300203	2015/8/31
2015	Tianyu Information	300205	2015/1/21
2012	E-Hualu	300212	2012/7/23
2013	E-Hualu	300212	2013/6/19
2013	E-Hualu	300212	2013/12/26
2014	E-Hualu	300212	2014/5/23
2014	E-Hualu	300212	2014/6/13
2014	E-Hualu	300212	2014/7/23
2014	E-Hualu	300212	2014/10/11
2014	E-Hualu	300212	2014/11/25
2015	E-Hualu	300212	2015/3/25
2015	E-Hualu	300212	2015/5/20
2015	E-Hualu	300212	2015/6/19
2015	E-Hualu	300212	2015/6/19
2015	E-Hualu	300212	2015/7/7
2015	China Sun Pharmaceutical Machinery	300216	2015/8/19
2014	Sungrow Power	300274	2014/4/4
2014	Sungrow Power	300274	2014/4/11
2016	Sungrow Power	300274	2016/3/29
2014	Longmaster Information	300288	2014/9/28
2015	Longmaster Information	300288	2015/6/30

2016	Leadman	300289	2016/8/23
2015	HLBN	300291	2015/7/7
2016	Leyard	300296	2016/3/22
2016	Leyard	300296	2016/6/13
2015	Tianshan Animal Husbandry	300313	2015/4/22
2015	Top Resource Conservation & Environment Corp.	300332	2015/9/14
2015	Top Resource Conservation & Environment Corp.	300332	2015/9/17
2013	Top Resource Conservation & Environment Corp.	300355	2013/1/28
2014	East	300376	2014/8/25
2014	East	300376	2014/9/3
2015	East	300376	2015/6/24
2015	East	300376	2015/12/2
2016	Huaming Intelligent	300462	2016/8/15
2016	Zhongfei	300489	2016/11/17
2016	Haibo Heavy Science	300517	2016/12/22

Event Research Method

Identify events and event windows

This paper studies the market reaction after the company's announcements of its alliance with the government, that is, the impact of the alliance announcement on the stock price, so the event research method is adopted. Event research methods are mostly used in mature capital markets such as Europe and the United States. Foreign studies usually use cumulative abnormal return (CAR) as a measurement indicator. This paper also uses this indicator. According to the majority of experience and conclusions in the relevant literature, the Chinese securities market has not reached the semi-strong effective market status. Therefore, before and after the announcement date, the stock price is expected to have a stock price change for important events. Furthermore, this paper defines the announcement date as the 0th day of the window event, calculating 4 days forward, and 4 days backward, and the entire event window has 9 trading days.

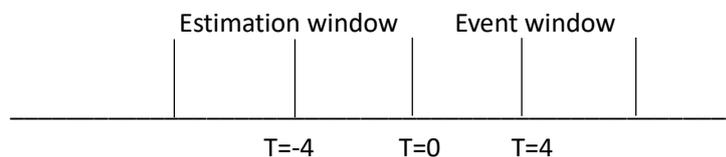


Table 1. window event and estimation window chart

Calculating normal return and abnormal return

The abnormal return is equal to the actual return of the event window minus the normal return. There are currently four ways to calculate normal returns.

Mean value model: Take the daily average return in the sample company estimation window as the daily normal return in the event window.

Asset pricing model:

$$R_{i,t} = R_f + \beta_i(R_{m,t} - R_f) + \varepsilon_{i,t} \quad (1)$$

In the above formula, R_f represents risk-free return; $R_{m,t}$ represents market yield; i represents the i -th enterprise.

Market model:

$$R_{i,t} = a_i + b_i \times R_{m,t} + \varepsilon_{i,t} \quad (2)$$

The above formulas, a_i and b_i , are calculated based on the market yield during the estimation period and the individual stock returns.

Market return method: Take the stock market rate of return in the event window as the normal rate of return of the sample company.

This paper adopts the market return method. The specific cumulative abnormal return (CAR) calculation method is as follows:

(1) $R_{i,t}$ represents the actual rate of return for each sample stock at $[-4,4]$, and the actual rate of return for the i -th stock on day t :

$R_{i,t} = \frac{P_{i,t}}{P_{i,t-1}}$, t stands for time, $P_{i,t}$ and $P_{i,t-1}$ respectively indicate the closing price of the i -th sample stock on day t , $i=1,2,\dots,n$

(2) $R'_{i,t}$ Represents the stock market return (GEM) of t day, that is, normal return

(3) $AR_{i,t}$ Represents the daily abnormal return for each sample stock in $[-4, 4]$, $AR_{i,t} = R_{i,t} - R'_{i,t}$, the specific results are as follows:

Table 2. Statistics of normal return

Variable	N	Mean	SD	Min	Max
$AR_{i,-4}$	87	0.0070549	0.0342988	-0.065635	0.11552
$AR_{i,-3}$	87	0.0042473	0.03149	-0.065429	0.109529
$AR_{i,-2}$	87	0.0012536	0.0328881	-0.061497	0.103113
$AR_{i,-1}$	87	0.0056592	0.0299565	-0.064138	0.84769
$AR_{i,0}$	87	0.0007283	0.0290129	-0.061497	0.131908
$AR_{i,1}$	87	0.0040205	0.0331992	-0.065429	0.11552
$AR_{i,2}$	87	-0.0001008	0.0315348	-0.088928	0.104237
$AR_{i,3}$	87	0.001200	0.0322127	-0.065429	0.114745
$AR_{i,4}$	87	0.0024927	0.0308347	-0.061497	0.114745

(4) AAR_t represents the average abnormal rate of return for all sample stocks at [-4, 4] per day, which is the arithmetic mean of all stock abnormal return per day. The average abnormal return

of n samples on day t is $AAR_t = \frac{1}{n} \times \sum AR_{i,t}$

(5) CAR_t represents the cumulative abnormal return all sample stocks on the t-day of

[-4,4], $CAR_t = \sum AAR_t$

Table 3. Cumulative abnormal return statistics

Variable	N	Mean	SD	Min	Max
CAR_{-4}	87	0.0070549	0.0342988	-0.065635	0.11552
CAR_{-3}	87	0.0113022	0.0502225	-0.096266	0.193355
CAR_{-2}	87	0.0125558	0.0652846	-0.129617	0.236166
CAR_{-1}	87	0.018215	0.0790747	-0.193755	0.315009
CAR_0	87	0.0189432	0.0923375	-0.158916	0.380255
CAR_1	87	0.0229638	0.1113451	-0.159445	0.436463
CAR_2	87	0.0228629	0.1281764	-0.176297	0.5407
CAR_3	87	0.0240829	0.1327377	-0.205295	0.608534
CAR_4	87	0.0265756	0.1375135	-0.170456	0.651345

Finally, use the T test to verify the significance of AAR_t and CAR_t . The premise of the one-sample t-test is that the sample obeys or approximates a normal distribution, so assuming that the government alliance event has no effect on the stock price, AAR_t and CAR_t obey a normal distribution with a mean of 0. If AAR_t and CAR_t are significantly different from 0, the null hypothesis is rejected, this indicate that the government alliance event has an impact on the stock price. The test statistics are:

$$T_{AAR} = \frac{AAR_t}{S(AAR_t)/n}, \quad S(AAR_t) = \sqrt{\frac{1}{n-1} \sum_{i=1}^n (AR_{i,t} - AAR_t)^2}$$

$$T_{CAR} = \frac{CAR_t}{S(CAR_t)/n}, \quad S(CAR_t) = \sqrt{\frac{1}{n-1} \sum_{i=1}^n (CAR_{i,t} - CAR_t)^2}$$

Multiple Linear Regression Analysis

This paper uses a multiple linear regression model to verify the factors that influence the market reaction of the government's announcement. This paper select the cumulative abnormal return the event period [-4, 4] as the dependent variable, and select the company scale, asset-liability ratio, Tobin's Q, equity cash flow, common stock interest rate, and the top ten shareholders' shareholding ratio etc. represent as the independent variables to explore the impact of these

variables on the government alliance's announcement of market responses. The multiple linear regression model is as follows:

$$CAR[-4,4] = \beta_0 + \beta_1 * SIZE + \beta_2 * LEV + \beta_3 * TOBINS'Q + \beta_4 * CASHFLOW + \beta_5 * RATEOFRETURN + \beta_6 * CRIO + \varepsilon$$

Among them, β_0 is a constant term, ε is a residual, and $\beta_1, \beta_2 \dots$ are coefficients. The definition of each variable in the model is as follows:

Table 4. Variable definition

Variable Type	Variable Name	Code	Variable definition
Dependent variable	Cumulative abnormal rate of return	CAR [-4,4]	Total 9 trading days from the forward 4th to the later 4th of the GEM government strategic cooperation announcement.
Independent variable	Company scale	SIZE	GEM and government strategic cooperation announcement total assets at the end of the previous quarter and take natural logarithm
	Asset-liability ratio	LEV	GEM and government strategic cooperation announcement of asset-liability ratio at the end of the previous quarter, total liabilities / total assets
	Tobin's Q Value	TOBINS'Q	Tobin's Q value of GEM = (current market value at the end of the first quarter of the announcement + amount of non-tradable shares in net assets + total long-term liabilities + total short-term liabilities) / total assets at the end of the previous quarter of the announcement
	Equity cash flow	CASHFOLW	GEM and government strategic cooperation announcement of the equity cash flow at the end of the previous quarter
	Common stock interest rate	REAEOFTRTURN	GEM corporate government strategic cooperation announcement at the end of the

			previous quarter, the percentage of dividends per share and the market price per security
	Top ten shareholders' shareholding ratio	CRIO	The sum of the shareholding ratio of the top ten shareholders at the end of the first quarter of the first quarter of the GEM

EMPIRICAL RESULTS AND ANALYSIS

Market Reactions Announced by Government Alliance

Table 5. T-test results of the cumulative abnormal return of sample stocks

Date	AAR	CAR	T-value
-4	0.007055	0.007055	1.9185*
-3	0.004247	0.011302	2.0991**
-2	0.001254	0.012556	1.7939*
-1	0.005659	0.018215	2.1486*
0	0.000728	0.018943	1.9135*
1	0.004021	0.022964	1.9237*
2	-0.0001	0.022863	1.6637*
3	0.00122	0.024083	1.6923*
4	0.002493	0.026576	1.8026*

Note. The T test uses a bilateral test with a critical value of 1.9879 at a significant level of 5% and a threshold of 1.6628 at a significant level of 10%; a “*” in the T value indicates a test at a significant level of 10% and the results were significant, and “**” indicates that the test results were significant at a significant level of 5%.

From the T-test results of the cumulative abnormal return, it can be seen that among the 9 days event window, the test results at the 5% significant level of the event window are significantly significant for 2 days, and the test results were significant at 10% of the significant level for 7 days, t. The results of the 9 days event window are statistically significant, so it can reflect that the event information causes market reaction, that is, the announcement of the alliance between the enterprise and the government will cause the market to react positively, but it is not caused by non-random factors.

From the chart it can be seen that the average abnormal rate of return (AAR) fluctuates between 0 and 0.005 around the announcement date, while the cumulative abnormal rate of return (CAR) is positive from -4 to 4 and always keeps rising, which indicates that the government alliance announcement has a positive effect on market reaction. On the 1st day before the announcement, CAR rose sharply, indicating that the announcement information may be leaked in advance. It

also shows that the Chinese securities market has not reached the semi-strong effective market status. Therefore, before and after the announcement date, the stock price is expected to have a stock price change for important events. The hypothesis is valid.

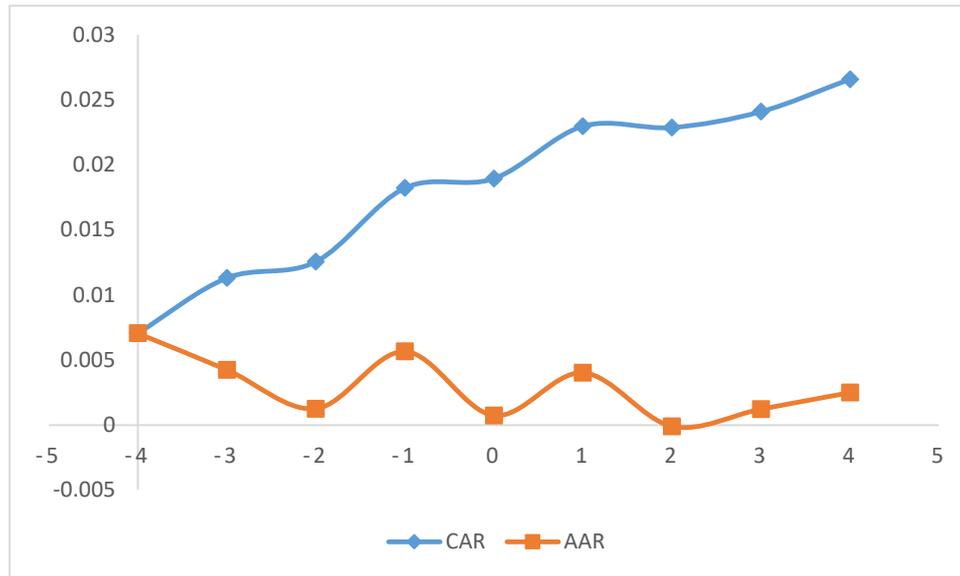


Figure 2. Average abnormal return and cumulative abnormal return in the announcement event period of strategic alliance with government

Empirical Results and Analysis of Influencing Factors of Government Strategic Cooperation Announcement Effect

This paper uses CAR [-4,4] as an explanatory variable to analyze the factors affecting the market reaction of the government's strategic cooperation announcement. It takes the company's size, asset-liability ratio, Tobin's Q, equity cash flow, common stock interest rate, top ten shareholders such as shareholding ratio as explanatory variables to establish multiple linear regression equations. The regression results are shown in the table.

Table 6. results of multiple linear regression analysis

Variable	coefficient	T-vaule	Sig.
SIZE	1.711177	0.51	0.615
LEV	0.0525225	0.50	0.617
TOBINS'Q	0.6674633	2.13	0.037**
CASHFOLW	0.0000682	1.81	0.074*
REAEOFTRTURN	9.206181	2.06	0.043**
CRIO	-0.0294327	-0.20	0.842

The empirical results show that the company size (SIZE) is positively correlated with CAR [-4, 4] and is consistent with expectations. That is, the larger the enterprise scale is, the higher

the degree of attention will get, the relatively transparent information is, and the greater the response to the government's strategic cooperation announcement will be. However, because this indicator is not statistically significant, it cannot be proved that the hypothesis is valid.

The asset-liability ratio (LEV) is positively correlated with the empirical results of CAR [-4, 4], which is inconsistent with expectations, and this indicator has not passed the significance test.

The Tobin's Q value (TOBINS'Q) is positively correlated with the empirical results of CAR [-4, 4], which is consistent with expectations, and is significant at a significant level of 5%, the hypothesis is valid. There is a positive linear correlation with the cumulative abnormal rate of return. Therefore, it shows that the Tobin's Q value is large, indicating that the market is optimistic about the future expectations of the company, and in addition to the strategic cooperation between the company and the government, the market is also more positive.

The equity cash flow (CASHFOLW) is positively correlated with CAR [-4, 4], which is in line with expectations and is significant at a significant level of 10%, the hypothesis is valid. The cash flow of equity is the cash flow that the enterprise can provide to the equity investor in a certain period of time, and it has a positive linear correlation with the cumulative abnormal return rate, indicating that the higher the index is, the more likely the higher cash income can be brought to the shareholders. The market is optimistic about the company's future expectations, and the market's positive reactions will also become more obvious because of the government's strategic cooperation announcement.

The empirical results of the common stock interest rate (REAEOFTRTURN) and CAR [-4, 4] showed a positive correlation, which was in line with expectations, and the results were significant at the 5% significant level, and the hypothesis was valid. The higher the interest rate of common stock is, the higher the return rate of shareholders will be, and it will be more favored by investors. The company announced the strategic cooperation with the government, the market expects that the benefits from the purchase of the company's stock will increase, and the cumulative abnormal rate of return will increase accordingly.

The empirical results show that the top ten shareholders' shareholding ratio (CRIO) is negatively correlated with CAR [-4,4], which is consistent with expectations, but this indicator is not statistically significant and cannot prove that the hypothesis is valid.

RESEARCH CONCLUSIONS AND ENLIGHTENMENT

This paper studies the short-term effects of government and enterprise cooperation, that is, the short-term market reaction after the announcement of the company's release about its government cooperation alliance. The empirical results of the event research method show that the company has a positive market reaction after the announcement of the alliance with the government, and the cumulative abnormal rate of return has increased significantly, indicating that the market is optimistic about the future expectations of the company.

It shows from the results of multiple linear regression that all the indicators related to corporate performance and governance structure have failed to pass the test, and the statistical results are not significant, which indicates that after the announcement of the government strategic alliance announcement, the indicators of performance and governance structure are not significant in the short term. While the indicators related to the return on stocks and the value of corporate investment have all passed the test. The statistical results show significant results, indicating that after the announcement of the government strategic alliance announcement, the stock returns, corporate investment value and other relevant indicators has significant market response in the short-term market, which indicates that investors in China's current stock market are still dominated by speculation, and the purpose is to achieve profit in the short term. Most people will not hold stocks for a long time because they are not optimistic about the future development prospects of the company.

Overall, the study results show that the strategic alliance between enterprises and the government has a positive market reaction, the cumulative abnormal rate of return has increased significantly, the stock price has risen, and the market is optimistic about the future expectations of the company. The new model of cooperation between government and enterprise has been recognized by the market, and it is also helpful in the company's stock price increase.

REFERENCE

- Cao, R. Z., Dai, T. T., Guo, H. (2014). Research on Competitive Intelligence Strategic Alliance Based on Government, Industry and Research. *Information Theory & Practice*, 37(08): 12-17.
- Chen, H. (2011). An Empirical Analysis of the Effectiveness of China's Stock Market in the Post-Financial Crisis Period. *Journal of Zhongnan University of Economics and Law*, (02):74-79+117.
- Deng, H. Z. (2013). Research on the Stock Price Change of the Second Generation of Family Business. *Southwestern University of Finance and Economics*.
- Feng, Y. (2013). Empirical Research on Stock Repurchase of Listed Companies in China. *Shanghai Jiao tong University*.
- Guo, J. B. (2013). Research on the Impact of Mergers and Acquisitions on the Performance of Listed Companies' M&A. *Zhejiang University of Finance and Economics*.
- Jiang, X., Pan, Y. T., Su, X. N. (2015). Analysis of the evolution of the research on the development of cooperation between government, industry, academia and research in China from the literature output. *Chinese Journal of Management*, 12(12): 1805-1814.
- Kang, H. (2005). Research and Design of Event Research Algorithm. *Hebei University of Technology*.
- Li, D. (2018). Research on the Relationship Between Corporate Sustainable Development and Market Value. *University of Electronic Science and Technology*.

- Liu, Y. Y., Liu, X. (2006). Promoting the cooperation between government, industry, and research to enhance the innovation ability of Jinan City. *Science and Technology Information*, (12): 20-21.
- Luo, J. H., Zuo, Y. H., Yang, D. D., Zhu, L. U. (2016). Market Validity Test Based on Shanghai A-Share Market. *Times Finance*, (09): 156-158.
- Narayan. P. K, Narayan S. (2007). Mean Reversion in Stock Prices: New Evidence from Panel Unit Root Tests. *Economics Bulletin*, 3(September): 233-244.
- Qian, J. M. (2007). The Role of the Government, Industry, Academia and Research Alliance in the Research and Development of Key Technologies for Industrial Commons. *Today Science and Technology*, (05): 11-12.
- Shi, R. R. (2016). Research on the Cumulative Excess Return Rate of A-Shares in Shanghai Stock Market and Its Influencing Factors. *Hefei University of Technology*.
- Tang, Y. T. (2013). Research on M&A Performance Based on Event Research Method——Taking Baidu to Acquire PPS as an Example. *Business*, (41): 49-49.
- Wang, P., Zhang, J. B. (2013). Foreign Direct Investment, Government-Industry-Study Cooperation and Regional Innovation Output——An Empirical Study Based on Panel Data of Thirteen Provinces and Cities in China. *Economist*, (01):58-66.
- Yang, Y. P., Zhou, Y. H. (2013). Cost Increase, Industrial Transfer and Structural Upgrading——An Empirical Study Based on Large and Medium-sized Cities across the Country. *China Industrial Economy*, (07): 147-159.
- Zhuang, T., Wu, H. (2013). Research on the Three-Helical Measurement of China's Government, Industry, and Research Based on Patent Data——Concurrently on the Role of Government in Industry-University-Research Cooperation. *Management World*, (08):175-176.