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An Empirical Analysis on the Management Strategy of the Growth in Dividend Payout Signal Transmission Based on Event Study Methodology

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Abstract

This paper applies event study methodology to test and verify the effect of sustainable growth in cash dividend information transmission via stock market according to information transfer theory. The research results show that, Chinese investors pay no attention to the rational financial strategy for the management of sustainable growth of listed companies and cash dividend information cannot convey the sustainable growth of listed companies via stock market.

Key words: Cash dividend; Sustainable growth; Strategy; Research

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1. RESEARCH METHODS

The commonly used methods of calculating the excess earnings include cumulative excess returns method (CAR), random correlation coefficient regression method and comparative income method. In this paper, the cumulative excess returns method will be used to calculate the cumulative excess returns rate of the stock. In order to estimate the abnormal stock returns, we must estimate the normal or expected rate of return. In the expected return estimates manner, the sample observation value during the evaluation period is first used to calculate the parameter values of equilibrium expected returns model, and then we use these parameter values to calculate the expected rate of return during the event period. Here, the market model is used to estimate the expected rate of return on the stock, and its estimation is as follows:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$
$$R_{it} = (P_{it} - P_{i(t-1)}) / P_{i(t-1)}$$
$$R_{mt} = (Index_{mt} - Index_{m(t-1)}) / Index_{m(t-1)}$$

Wherein: R_{it} is the yield of stock i on day t, R_{mt} is the yield of market on day t, α_i, β_i are the estimation from the market model from one year to ten days before the dividend announcement, ε_{it} is a random error term; P_{it} and $P_{i(t-1)}$, respectively, represents the closing price of the stock i on day t and day t-1, $Index_{mt}$ and $Index_{m(t-1)}$, respectively the closing index of SSE or SZSE Index components on day t and day t-1.

In reaching α_i and β_i, these two regression coefficients, the market models are used to predict the normal expected stock returns in the trading days before and after dividend announcement, i.e.

$$E(R_{it}) = \alpha_i + \beta_i R_{mt}$$

After getting the expected normal rate of return, you can calculate excess returns of the stock i after the risk adjustment on the day t after the dividend announcement, the formula is:

$$AR_{it} = R_{it} - E(R_{it}) \quad t = -5 \text{ (or-10)} \ldots + 5 \text{ (or+10)}$$

Wherein, AR_{it} is the excess return of the stock i on day t; R_{it} is the effective yield of stock i on day t; $E(R_{it})$ is the expected normal rate of return of the stock i on day t.

At this point, the average daily stock excess returns and cumulative average excess return of the sample can be calculated, the former's formula is:

$$AAR_t = \frac{1}{N}\sum ARit$$

Wherein, N is the number of sample stock, the latter's formula is:

$$CAR_{it} = \sum_{-t}^{+t} AARt$$

2. RESEARCH HYPOTHESIS

2.1 When the Difference Growth Rate is Greater than Zero

According to Higgins's sustainable growth management theory, when the actual growth exceeds sustainable growth, it means that the company's resources encounters shortage situation; then although there is a zero limit for the reduction in dividend payout ratio, it is a balanced growth financial strategy which can not be ignored by the manager. However, Higgins also believes that shareholders' dividend payment interests usually change inversely with their feelings for the investment opportunities of companies. When the shareholders believe that the retained earnings can be used to earn a satisfactory effective rate of return, they will be happy to give up the existing dividends in order to facilitate access to higher dividends in the future, which can cause stock prices to rise. On the other hand, if the company can not guarantee a satisfactory income for investment opportunities, i.e., the shareholders believe that there is excessive investment management behavior; shareholder will only be unhappy about the reduction in dividends, thus causing stock prices to decline. As the capital market has information asymmetry and agency problems, the cost of external finance is higher than internal financing, and internal funds are more susceptible for the management to control; foreign capital will bring constraint mechanism, which restricts the managers' decision-making behavior, thus retained earnings are preferred by the management in financing, which is the rational decision-making behavior and capable of maximizing the interests of shareholders.

However, if the companies still increase dividend payment when the difference growth is greater than zero,, then in accordance with the growth management theory, if the investment opportunities are good, this decision is not conducive to maximizing the shareholders' wealth. And if investment opportunities are poor, the decision-making will get the recognition of the investors.

Based on the above theoretical analysis, we use Tobin'Q as variables to determine whether there is a good investment opportunity viariable, Tobin'Q = (per share price × number of circulation shares + per share net assets× number of non-tradable shares + book value of liabilities) / total book value of assets, wherein, if Q is greater than 1, it indicates a good investment opportunity, if Q is less than 1, it indicates that investment opportunities are poor, we make the following assumptions:

Assumption 1: When the difference growth rate is greater than zero, if Q is greater than 1, the company's market value with the dividend reduction will increase; if Q is less than 1, the company's market value with the dividend reduction will decrease.

Assumption 2: When the difference growth rate is greater than zero, if Q is greater than 1, the company's market value with the dividend increase will reduce; if Q is less than 1, an increase in the company's market value with the dividend increase will increase.

2.2 When the Difference Growth Rate is Less than Zero

If the sustainable growth rate exceeds the actual growth rate of the company, it means that the company still has idle resources after investing in its investment areas (it does not matter with the discussion about investment opportunities), and the money is returned to shareholders as the most direct way to solve the problem of idle resources. To put money back to shareholders, there are two ways: one is to increase dividends; the other is to buy back shares. But Higgins believes that this solution is not in most strategic selection ranges of the senior management. The reason is that many managers seem to have a preference for growth. Personally, many managers are inconsistent with the practice of paying substantial dividends, as this would imply failures. Shareholders entrust their capital investment profitable responsibilities to the management, and the management return the money back to the shareholders, which make people think that they are unable to perform basic management functions; dividends narrow the field of management, and it is a kind of behavior contrary to human nature. Some scholars have also demonstrated at the organizational level that there is the preference for growth. It is found in a detailed study about experienced senior management decision-making behavior and comprehensive examination in 12 large companies that even if it is uneconomical, senior management normally choose to grow and do not take into account the long-term survival of their organization. So, at this time if we raise the dividend payout ratio, it will help reduce management's control resources, reduce over-investment behavior of the management, which is conducive to safeguarding the interests of shareholders (WANG, 2005). Based on the above theoretical analysis, we propose the following hypothesis:

Assumption 3: When the difference growth rate is less than zero, the company's market value with the dividend increase will increase.

Assumption 4: When the difference growth rate is less than zero, the company's market value with the dividend reduction will decrease.

3. VARIABLE DESIGN

Table 1
Definition of Dependent Variables and Independent Variables

Variable	Code	Description
Dependent variables	CAR	The market value is expressed in CAR; if the value is positive, it indicates an increase in the stock; if the value is negative, it indicates a decline in the stock.
Dummy variables1	$DUMMY_1$	When DGR> 0 and Q> 1, it is 1, and 0 otherwise
Dummy variables2	$DUMMY_2$	When DGR> 0 and Q <1, it is 1, and 0 otherwise.
Dummy variables3	$DUMMY_3$	When DGR <0, it is 1, and 0 otherwise.
Dependent variables1	$DIVR \times DUMMY_3$	When the difference growth rate < 0, changes in the cash dividend payment.
Dependent variables2	$DIVR \times DUMMY_1$	When differences growth > 0 and there is a good investment opportunity, the changes in the cash dividend payment.
Dependent variables3	$DIVR \times DUMMY_2$	When difference growth rate > 0 and investment opportunities is poor, changes in the cash dividend payment.

4. EXCESS RETURNS EMPIRICAL RESULTS AND ANALYSIS

Cumulative excess return rate method is widely used in information content study; in this section, by examining the average cumulative excess returns of a specific study window at regular intervals (possibly one day, one week or one month) before and after the dividend announcement day, we determine the impact of the dividend policy on stock prices at different growth period of the company, the results are shown in Table 2 and Figure 1 below:

Table 2
Comparative Analysis of Excess Returns Ten Days Before and After Dividend After the Dividends Announcement Date

Time	Minimum	Maximum	Mean	Standard deviation	T Value
-10	-0.2288	0.0811	-0.00069	0.01879	-1.126
-9	-0.0777	0.1163	-0.00100	0.01770	-1.743**
-8	-0.0749	0.0981	-0.00023	0.01632	-0.434
-7	-0.0691	0.1079	0.00087	0.01723	1.557
-6	-0.0911	0.1049	0.00080	0.01723	1.424
-5	-0.0866	0.0820	0.00027	0.01628	0.505
-4	-0.2016	0.1134	0.00070	0.01947	1.105
-3	-0.00848	0.1110	-0.00029	0.01681	-0.534
-2	-0.0737	0.1134	-0.00061	0.01640	-1.141
-1	-0.0888	0.0999	-0.00001	0.01796	-0.021
0	-0.0917	0.1204	0.00295	0.02286	3.975***
1	-0.2877	0.1460	-0.00013	0.02244	-0.176
2	-0.1345	0.0944	0.00014	0.01806	0.231
3	-0.1591	0.0931	0.00014	0.01771	0.247
4	-0.3884	0.1095	-0.00153	0.02613	-1.802**
5	-0.3006	0.1122	-0.00048	0.02225	-0.663
6	-0.1009	0.1100	0.00059	0.01857	0.977
7	-0.0829	0.1106	0.00069	0.01905	1.124
8	-0.0592	0.0998	0.00022	0.01747	0.395
9	-0.0589	0.1239	0.00026	0.01775	0.449
10	-0.1261	0.0995	-0.00048	0.01812	-0.817

Note: (1) *** indicates significant correlation at the 0.01 level; ** indicates significant correlation at the 0.05 level; * indicates correlation at the level of 0.1; (2) are two-sided test

From Table 2 and Figure 1, it is shown that at the (-10, 10) window, which indicates ten days before and after the dividend announcement, the average AR is highest on the announcement day, and most significant, indicating on the day of the announcement, the dividend has the information content; But the daily average AR is generally not significant; the statistics show that the dividends is only significant on the ninth day before the announcement and on the fourth day after the announcement; this may be due to China's stock market reaction's instability, and investors are more scattered, with uneven quality, it may also be possible due to the impact of other announcement information such as the earnings information close to the announcement date, so it needs further analysis of statistical tests, for which we intend to use multiple regression analysis to control the other factors' impact on excess returns to analyze the dividends market reaction. In the selection window, we refer to selection methods of a number of scholars (CHEN, 1998), combine with the above AR mean test results, and finalize a window as shown in Table 3:

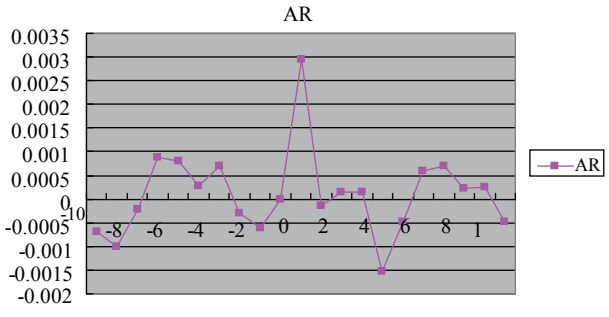

Figure 1
Average AR Comparison Chart of Samples at (-10, 10) Window Period

Table 3
The Selected Window CAR Descriptive Statistics and Mean Test

Window period	Minimum	Maximum	Mean	Standard deviation	T Value
(-10,10)	-0.43264	0.41403	0.00218	0.07760	0.868
(-9,9)	-0.35713	0.67546	0.00335	0.07771	1.329
(8,8)	-0.43241	0.62713	0.00409	0.07389	1.707*
(-7,7)	-0.53116	0.58171	0.00409	0.07106	1.778*
(-6,6)	-0.62817	0.56899	0.00253	0.06857	1.139
(-5,5)	-0.52774	0.50166	0.00114	0.06575	0.537
(-4,4)	-0.43686	0.47273	0.00135	0.06028	0.694
(-3,3)	-0.39182	0.40441	0.00218	0.05097	1.322
(-2,2)	-0.32081	0.31071	0.00233	0.04330	1.662*
(-1,1)	-0.22409	0.22140	0.00280	0.03625	2.386*

Note: (1) *** indicates significant correlation at the 0.01 level; ** indicates significant correlation at the 0.05 level; * indicates correlation at the level of 0.1; (2) are two-sided test

For the study window above, we found that the mean cumulative excess return of each window is greater than 0; the mean cumulative excess returns of the window periods of (-1, 1), (-2, 2) near the announcement date is generally greater and has generally passed the test of significance; while for the average cumulative abnormal return of longer window periods of (-8, 8), (-7, 7), the two windows, at $\alpha = 0.10$ it is significant, the other windows are not significant. This indicates that the market reaction overall duration of cash dividend is not long. This paper will select the window period at least passing through the $\alpha = 0.10$ significance t test as the study window for multiple regression analysis.

5. CUMULATIVE EXCESS RETURN REGRESSION RESULTS ANALYSIS

5.1 Long Window Period Regression Results

Long window period (-8, 8), (-7, 7) regression results are shown in Table 4:

Table 4
Long Window (-8, 8), (-7, 7) Regression Results

Window period	(-8, 8)		(-7, 7)	
	BETA	T Value	BETA	T Value
(Constant)		0.376		0.556
$DIVR \times DUMMY_3$	-0.036	-0.669	-0.027	-0.511
$DIVR \times DUMMY_1$	0.029	0.583	0.031	0.623
$DIVR \times DUMMY_2$	0.011	0.315	-0.004	-0.115
R^2	0.014		0.115	
Adj-R^2	-0.005		-0.006	
F	0.753		0.695	
D-W Value	2.060		2.091	

Note: (1) *** indicates significant correlation at the 0.01 level; ** indicates significant correlation at the 0.05 level; * indicates correlation at the level of 0.1; (2) are two-sided test.

As can be seen from Table 4, during the (-8, 8), (-7, 7) window periods, the CAR overall response of each variable is not significant.

R^2 is small, the regression line fits poorly with the sample observed values, Adj-R^2 is less than 0, which indicates that in this window period, it can not be explained by the regression line, and the results for the overall significance test (F value) of multiple linear regression model were not significant, indicating that in the longer term, the stock price changes may be more affected by other information, rather than the impact of changes in cash dividends; D-W value is close to 2, which indicates that the overall regression equation has no autocorrelation. Therefore, we can prove that the market reaction duration of sustainable growth management strategy adjustments cash dividends adopted by the management of listed companies in the two industries is not long.

5.2 Short Window Period Regression Results

Short window periods (-2, 2), (-1, 1) regression results are shown in Table 5 below:

Table 5 shows the regression results:

(1) In (-2, 2), (-1, 1) window period, DIVR × DUMMY3 coefficient is negative, which indicates that when the difference growth rate is less than zero, the dividend change rate is negatively correlated with the CAR, meaning increase in the dividend will cause the stock price decline, while dividend cuts will lead to price rise, which is contrary to our hypothesis; the results only passes through the $\alpha = 0.10$ t- test in the (2, 2), suggesting that investors have no great concern about the management financial strategy in the case of the actual growth rate is less than sustainable growth rate. $DIVR \times DUMMY_1$ coefficient is positive, indicating that the difference growth rate is greater than zero with good investment, the dividends change rate is positively correlated with CAR, dividend reduction will lead to share price decrease; while increasing dividends will result in increased dividends, which is contrary to our hypothesis, and the statistical results also did not pass the significance test, suggesting that investors pay no attention to the financial strategy of the management under the condition that the actual growth rate is greater than the sustainable growth rate. DIVR × DUMMY2 the coefficient is negative, indicating that when the difference growth rate is greater than zero with poor investment opportunities, dividend change rate is negatively correlated with CAR. Cutting dividends will lead to share price rise; increasing dividend will result in stock price decline, which results have passed the significance test in two a window periods, but the statistical results are contrary to our hypothesis, suggesting that investors are not accepting the rational financial strategy of sustainable growth management of listed companies at this time.

Table 5
Short Window (-2, 2), (-1, 1) Regression Results

Window period	(-2, 2)		(-1, 1)	
	BETA	T Value	BETA	T Value
(Constant)		-0.422		-0.353
$DIVR \times DUMMY_3$	-0.008	-0.144*	-0.031	-0.586
$DIVR \times DUMMY_1$	0.035	0.715	0.058	1.174
$DIVR \times DUMMY_2$	-0.076	-2.113**	-0.062	-1.751**
R^2	0.034		0.040	
Adj-R^2	0.015		0.022	
F	1.804**		2.180***	
D-W Value	1.977		1.908	

Note: (1) *** indicates significant correlation at the 0.01 level; ** indicates significant correlation at the 0.05 level; * indicates correlation at the level of 0.1; (2) are two-sided test.

(2) R^2 is small, the regression line fits poorly with the sample observed values, but if Adj-R^2 is not less than zero, which can still be explained by the regression line; while for the multiple linear regression model overall significance test (F value) results which are significant, it suggests that the regression model is significantly established according to the relationship between the variables; when D-W values are between (0, 4) which indicates the overall regression equation has no autocorrelation.

CONCLUSIONS

The research results on the management strategy of the growth in dividend payout signal transmission based on event study show that the cash dividend information can not convey the company's sustainable growth of listed companies via the stock market. Chinese investors pay no attention to the rational financial strategy for the management of sustainable growth of listed companies, the cash dividend signal transmission theory is not as significant in our country as in foreign countries, that is, cash dividends information in the event window has no significant impact on the abnormal return on the stock, which are consistent with many domestic scholars' results. Generally, it is believed that China's stock market has strong speculation and investors are lack of the relevant value investment philosophy, which results in the poor results of the cash dividends listed companies, thus bringing difficulty to financial decisions of the management and leading to selecting the non-efficient financial strategies.

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