The Influence of Cash Dividend Policy on Stock Price of Listed High-tech Enterprises

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Abstract: With the rapid development of high-tech enterprises, how to attract more investors to invest in such enterprises is particularly important,And a key criterion of investors' investment judgment is dividend policy. Enterprises believe that cash dividend distribution can send a signal to investors that enterprises have good cash flow and profitability, so as to promote the rise in stock prices. In order to verify the rationality of this view,this paper takes high-tech enterprises listed in Shanghai and shenzhen stock markets as samples,and takes the stock return rate on the ex - dividend day as the standard to measure the stock price fluctuation to explore the influence of cash dividend policy on stock price. The research results show that the return on stocks of such enterprises will be negative when they distribute cash dividends as dividend policy, which indicates that investors do not prefer the distribution of cash dividends,and the stock price will fall on the date of ex-dividend.

The Introduction

As one of the main contents of the company's financial activities, dividend policy is not only the embodiment of the company's financial situation, the continuation of financing strategy, but also the signal of the company's future development strategy. However, China's stock market started late, and relevant researches on the stock market were later than those in western developed countries. Therefore, researches on the impact of dividend policies on stock prices are relatively limited, and many investors are not able to judge information transmitted by various listed enterprises through dividend policies at the practical level. In recent years, as a key industry supported by our country, the number of investors is increasing day by day. However, there are few researches on dividend policies of high-tech enterprises with the characteristics of high investment and high innovation.

According to the signal transmission theory, if the enterprises does not allocate or the allocation implementation plan decreases compared with the previous year, it indicates that the business condition of the enterprises may not be good, and there may be more unknown factors in the future development prospect of the company.As a result, cash as a dividend distribution plan will be favored by investors, the company's stock price will rise. And according to the theory of tax burden difference, as a result of the dividend tax rate is higher than capital gains, compared with the dividends on tax losses, investors prefer to continue to hold delay access to capital gains from shares, with cash as dividend distribution scheme will not by the preference of investors, from this sense, the company's share price will fall. Therefore, this paper takes high-tech enterprises listed in Shanghai and shenzhen as samples to study whether and how their cash dividend policies affect stock prices.

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Research Design

Sample Selection. This study listed on Shanghai and shenzhen two city high and new technology enterprises in our country as the original sample, according to the national ministry of science and technology torch center (2008) file of the standard of high and new technology enterprises, selected from 2009 to 2017 for nine consecutive annual meet the requirements of the file, a total of 57 national key support high-tech enterprises as a sample for empirical analysis, including a total of 258 samples of cash dividend (including annual distribution of sample data of multiple dividend).

Table 1 Implementation of dividend distribution screening classification from 2009 to 2017

Screening and classification			Number of samples	The proportion
Don't assign			98	19.10%
distribution	Mixed dividend	Mid	7	1.36%
		The annual	114	21.83%
	Stock dividend.	Mid	5	0.97%
		The annual	31	6.04%
	Cash dividend.	Mid	16	3.51%
		The annual	242	47.17%
A total of			513	100%

Model Design. In this paper, the least square method OLS is used to construct a multiple linear regression model to analyze the impact of cash dividend policy on stock price.

The influence model of cash dividend policy on stock price is as follows:

$$R_{it} = \beta_0 + \beta_1 DIV_{1it} + \beta_2 SIZE_{it-1} + \beta_3 ROE_{it-1} + \beta_4 P/B_{it-1} + \varepsilon_{it} \quad (1)$$

R_{it}= i the stock yield on the date of elimination of dividend and right in phase t;Div_{1it}= i enterprises cash dividend per share in phase t;$SIZE_{1it}$= i the SIZE of enterprises in phase t-1;ROE_{it-1}= i return on equity of the t-1 period of enterprises ;P/B_{it-1}= i the price-to-book ratio of enterprises at stage t-1;ε_{it}= i enterprises residual in phase t .

Variable Setting. explained variable: stock return rate (R_{it})

Stock yield is an index that reflects stock yield level. It is the ratio of the cash dividend paid by a corporation in the previous year to the stock price of the current period. It reflects the expected return of investors who buy shares at the current price. Stock yield is positive, on behalf of the stock has investment value, easy to get investors' favor. At this time, the greater the stock return rate, the greater the stock value, the more valuable the investment; If the return on stocks is negative, the opposite is true.

According to the statistics, there is no other situation that will lead to the change of circulating shares except the stock delivery and conversion on the day when the company except the right and dividend date. Therefore, the stock yield rate of the distribution of cash dividends on the day when the right and dividend date are excluded should be calculated as follows:

Ex-dividend reference price = closing price of share registration date - pre-tax cash dividend per share (2)

Ex-dividend day stock yield=(Ex-dividend day closing price - Ex-dividend reference price) /Ex-dividend reference price

(3)

According to the above calculation formulas, the stock yield is positive on the day when the dividend is removed, indicating that the stock price rises when the cash dividend is distributed.If the stock yield rate on the day of eliminating dividend is negative, it indicates that the stock closing price on that day is much lower than the stock closing price on the day of registration, and the stock price drops when distributing cash dividend.

explanatory variable: cash dividend (DIV)

Cash dividend (DIV_{1it}) represents the pre-tax cash dividend per share distributed by an individual stock in the year. In this paper, the year data of multiple distribution of distributed cash dividends including interim and annual distribution of cash dividends are selected. In this paper, dividend ratio (pre-tax) is used to measure cash dividends.

control variables:

The company size ($SIZE_{it-1}$) : Jing Wang[1] (2017) found that there was a significant positive correlation between the size of the company and the change of the stock price. Investors are more convinced that the larger company has a more stable operation and development status and a stronger ability to resist risks in the external market, and the stock yield rises along with the stock price.In this paper, the company size is measured by the logarithm of the total assets in the annual report of the year before the date of ex-dividend and ex-right.

Return on equity (ROE_{it-1}) : Yi Lin, Penlai Yang [2] (2016) found that return on net assets yield presents a linear positive correlation with shares and investors generally believe that the distribution of dividends to investors in the company's management operation status of transmission, the higher the return on net assets, shows that companies use the owner's equity reap the benefits of high efficiency, and distribute more cash dividend, the prompt stock yield improved.In this paper, the ratio of net profit to average owner's equity in the annual report of the year before the ex-dividend date is used to measure the return on equity.

Price-to-book ratio (P/B_{it-1}) : Yingyi Qiu [3] (2011) found that price-to-book showed significant negative correlation with the change of stock price, this is because the price-to-book are mainly used for stock investment analysis, price-to-book smaller stocks are more worth to invest in it, as the stock of low price-to-book phenomenon gradually was found by investors, investors will increase demand for the stock, stock prices will be higher, leading to the stock yield improvement.In this paper, the ratio of the total market value to the book value of shareholders' equity in the annual report of the year before the ex-dividend date is used to measure the price-to-book ratio.

Empirical Analysis

Correlation Analysis. Table 2 and table 3 show the correlation between stock return on ex-dividend day and each variable. It can be seen that whether Pearson correlation coefficient or Spearman correlation coefficient is adopted, the implementation of cash dividend as dividend policy by high-tech enterprises shows a negative correlation with stock return on ex-dividend day.Among them, if Pearson correlation coefficient is used for measurement to show a significant negative correlation at the level of 1%, it means that the higher the distribution degree of annual cash dividend of such enterprises are, the more severe the stock price declines on the day of ex-dividend and ex-right. This preliminary confirmation is inconsistent with hypothesis 1 of this paper and presents an opposite conclusion.Among the control variables, the company size (SIZE) and price-to-book ratio (P/B) are positively correlated with the stock return on the ex-dividend day, while the return on equity (ROE) is negatively correlated with the stock return on the ex-dividend day, but the correlation between the control variable and the stock return on the ex-dividend day is not significant.

Table 2 Correlation test: dividend policy and stock price (take cash dividend as dividend policy, Pearson correlation coefficient)

	R_{it}	Div_1	The $SIZE_{it-1}$	ROE_{it-1}	P/B_{it-1}
R_{it}		- 241.**	048.	- 024.	014.
Div_{1it}	- 241.**		138.*	475.**	- 023.
The $SIZE_{it-1}$	048.	138.*		140.*	- 240.**
ROE_{it-1}	- 024.	475.**	140.*		374.**
P/B_{it-1}	014.	- 023.	- 240.**	274.**	

**Represents a significant correlation at the 1% level (bilateral); *Represents a significant correlation at the 5% level (bilateral)

Table 3 Correlation test: dividend policy and stock price (take cash dividend as dividend policy, Spearman correlation coefficient)

	R_{it}	Div_1	The $SIZE_{it}$	ROE_{it}	P/B_{it}
R_{it}		- 103.	021.	- 093.	045.
Div_{1it}	- 103.		122.	644.**	- 038.
The $SIZE_{it}$	021.	1.22		017.	- 251.**
ROE_{it}	- 093.	644.**	017.		279.**
P/B_{it}	045.	- 038.	- 251.**	279.**	

**Represents a significant correlation at the 1% level (bilateral); *Represents a significant correlation at the 5% level (bilateral)

Regression Analysis. The correlation analysis conducted by Pearson correlation coefficient or Spearman correlation coefficient only shows the correlation between each variable roughly, and the specific correlation degree should be carried out regression analysis.In order to test whether the different degree of cash dividend distribution will affect the stock yield on the date of ex-dividend and ex-right, a linear regression analysis is conducted in this paper, and the analysis results are shown in table 4.

Hypothesis 1 is used to reflect the companies' cash dividend policy and the ex-dividend day except authority of the relationship between stock returns, look from the regression results, pretax per share cash dividend of the coefficient is negative and statistically significant level, 1% of cash dividend distribution level and ex-dividend day except authority stock returns appear extremely significant negative correlation, namely the cash dividend payments, the more the ex-dividend day day except authority fell the more powerful, regression results confirm didn't agree with hypothesis 1 and render the opposite conclusion.

In the control variable, although the size of the company is not significant, it is positively correlated with the stock return rate on the day of eliminating rights and dividends, which indicates that the larger the size of the enterprises, the smaller the operating risk will be, which will enhance the preference degree of investors for the enterprises, leading to the rise of the stock price.Return on equity (ROE) with the ex-dividend day stock yield except authority is not positively related but also significantly, explain enterprise management to use their own capital profit ability is stronger, to

investors release positive signals generated by the agent management of the company, increase the investor's trust for the enterprise operation ability, higher stock prices.

Table 4 Dividend policy and stock price (cash dividend as dividend policy)

The variable name	Beta coefficient	significant
$Beta._0$	- 054.	364.
Div_{1it}	- 079.	000.***
The $SIZE_{it-1}$	003.	315.
ROE_{it-1}	057.	143.
P/B_{it-1}	000.	769.
The F value	4.609***	
R^2	058.	
N	235	

***Represents a statistically significant level of 1%; **Represents a statistically significant level of 5%; *Represents a statistically significant level of 10%

Robustness Test. In order to further test whether the cash dividend distributed will affect the company's share price because in different fields of business , this article will divide this 57 business areas of high and new technology enterprises, altogether divided into electronic information technology, biotechnology and new medicine technology, aerospace technology, new material technology, resource and environmental technology to transform traditional industries, new and high technology and so on six big domains, and a robustness test was carried out.Due to the small sample size of enterprises paying cash dividends in the fields of aerospace technology, resources and environmental technology, robustness test cannot be conducted. The results of robustness test in the other four domains are shown in table 6, table 7, table 8 and table 9.

Table 5 Sample Numbers of six domains and cash dividend policies of high-tech enterprises from 2009 to 2017

Business domain	Number of samples	Business domain	Number of samples
Electronic information technology	49	New material technology	63
Biology and new medical technologies	36	Resources and environmental technology	5
Aerospace technology	7	New and high technologies will transform traditional industries	98
A total of	258		

Table 6 Robustness test: dividend policy and stock price (cash dividend policy in the field of electronic information technology)

The variable name	Beta coefficient	significant
$Beta._0$	- 403.	140.
Div_{1it}	- 151.	249.

The $SIZE_{it-1}$	020.	117.
ROE_{it-1}	186.	365.
P/B_{it-1}	- 004.	122.
The F value	1.578	
R^2	067.	
N	33	

***Represents a statistically significant level of 1%;**Represents a statistically significant level of 5%;*Represents a statistically significant level of 10%

Table 7 Robustness test: dividend policy and stock price (cash dividend policy in the field of biology and new medical technology)

The variable name	Beta coefficient	significant
$Beta._0$	157.	527.
Div_{1it}	- 006.	923.
The $SIZE_{it-1}$	- 007.	532.
ROE_{it-1}	053.	576.
P/B_{it-1}	- 002.	569.
The F value	245.	
R^2	- 116.	
N	30	

***Represents a statistically significant level of 1%;**Represents a statistically significant level of 5%;*Represents a statistically significant level of 10%

Table 8 Robustness test: dividend policy and stock price (cash dividend policy in the field of new material technology)

The variable name	Beta coefficient	significant
$Beta._0$	- 209.	094.*
Div_{1it}	- 090.	002.***
The $SIZE_{it-1}$	010.	084.*
ROE_{it-1}	8.637 e-6	1.000
P/B_{it-1}	002.	462.
The F value	5.814***	
R^2	249.	
N	59	

***Represents a statistically significant level of 1%;**Represents a statistically significant level of 5%;*Represents a statistically significant level of 10%

Table 9 Robustness test: dividend policy and stock price (cash dividend policy in the field of high-tech transformation of traditional industries)

The variable name	Beta coefficient	significant
$Beta._0$	006.	942.
Div_{1it}	- 032.	438.
The $SIZE_{it-1}$	- 001.	835.
ROE_{it-1}	074.	298.
P/B_{it-1}	002.	281.

The F value	1.016
R^2	001.
N	83

***Represents a statistically significant level of 1%; **Represents a statistically significant level of 5%; *Represents a statistically significant level of 10%

After the division according to the business fields, reasonable explanation can be made through the robustness test. Therefore, it is further confirmed that in high-tech enterprises, cash dividend distribution is negatively correlated with stock price fluctuation, that is, the more cash dividend distribution is, the more severe the stock price declines on the day of eliminating right and dividend.

Analysis of Empirical Results

The results of correlation analysis, regression analysis and robustness test above all show that the implementation of cash dividend as a dividend policy in high-tech enterprises is negatively correlated with the stock return on the date of ex-dividend and ex-right. Compared with other dividend distribution policies, this paper believes that the cause of this result is the relevant provisions of the current tax law in China.

At present, China's tax law stipulates that no matter whether cash dividends are paid or not, companies should pay corporate income tax, while investors should also pay dividend profits tax when cash dividends are paid. Although since 2013, the tax rate of dividend profits tax has changed from 10% to a differentiated income tax rate based on the length of shareholding, that is, the tax rate of shareholding over one year is 5%. 1 month to 1 year tax of shareholding is 10%; However, for short-term investors, the dividend profit tax brought by cash dividend distribution is still a heavy burden. Compared with dividend income tax, investors' income from stock transfer of listed companies is currently exempt from capital income tax. At the same time, investors have differences in the time of tax payment. Dividend profits tax is paid at the time of collection or declaration, while capital gains tax is paid at the time of sale, which is later than dividend profits tax. Investors can postpone tax payment. So continuing to hold shares can delay the tax payment of capital gains, which can reflect the time value of deferred tax payment. In addition,when the enterprises pay cash dividend, the net income of the owners' equity will decrease, monetary capital decreased at the same time, as a result, investors will think of cash dividend distribution can make the fall in the value of the enterprise, thus reduce investors' after-tax return on investment, leading to the enterprises the higher the level of cash dividend payments, the falling of share prices in ex-dividend and ex-right are more severe, and then make that stock yield negative.

The analysis results confirm the relaxed MM theory proposed by Farrar and Selwyn[4] (1967) from an empirical perspective:Tax burden difference theory, as the government’s tax rate on dividend is higher than capital gains, compared with the dividends on tax losses, investors prefer to continue to hold the cash dividend,to delay access to capital gains from shares, especially when investors have no intention to use dividend to reinvest, continue to hold stocks are free to choose liquidation time, deferred tax revenue, and delay to pay taxes to enjoy right with cash dividend. As dividend distribution plan of the enterprises will not be favored by investors, therefore it will cause investors to sell the stock,and then the price in the ex-dividend day will fall that day.

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