

Research on the Dividend Policy of Listed Company and Fluctuation Effect of Stock Market

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Abstract. Based on the dividend policy and theory, this article takes the events that A stock of all the listed banking companies (16 in total) issued dividend in the CSI stock market for 5 years from 2008 to 2012 as the investigation samples to inspect the relevance of dividend policy with the fluctuation of stock price and transaction volume, thus to prove the dividend policy is an efficient mechanism for information transmission.

Keywords. dividend policy; fluctuation of stock market; signal transmission

It is significant to study the dividend policy problem to reduce the market speculation and increase the effective investment in Chinese market. In 1950s, an American scholar Lintner became the first one to start a research on dividend policy. In 1961, two American experts, Miller and Modigliani, issued a famous thesis Dividend Policy, Growth and Share Price that induced a comprehensive discussion about the research on dividend policy. Through research for 50-60 years, the current western theory has been fairly mature and divided by a particular time, 1970s, into traditional and modern dividend policy theory. The traditional theory discusses about whether the dividend policy will induce changes in the stock price and transaction volume in the listed company; based on confirmation of the traditional theory, the modern version develops research on the factors that induce the fluctuation of share price and transaction volume.

1 Summary of signal transmission theory

Signal transmission theory holds an important status in the dividend policy theory. Bhattacharya was the first one that established the dividend signal model. It assumed the management of the company had information about the enterprise value unknown to the investors, and the dividend policy might efficiently reduce the symmetrical degree. Thereafter, the scholars successively set up various theoretical model for research. Miller pointed out that the dividend policy may induce the fluctuation of share price and transaction volume because it gives out information about the future situation of company's profits to the market, which is called the hypothesis of dividend information content. Finally, the scholars incorporated the signal transmission and hypothesis of dividend information content to form a theory of dividend signal transmission. The signal transmission theory has been widely accepted, but there are still some other opinions in the theoretical world. Is there on earth any relevance of dividend policy with the fluctuation of stock price and transaction volume in the listed company? Whether the dividend policy is an efficient mechanism for information transmission? So we select the dividend policy announcement and try

to prove the effect of dividend policy on the fluctuation in the stock market in the perspective of stock price and transaction volume in the listed company. Most of the previous research focused on the stock price, but there is little research on the transaction volume of stock. So this article will concentrate on the changes in the transaction volume of stock, which becomes an innovative point for this article.

2 Research on the dividend policy and fluctuation effect of stock market in China

(1) Research method. Event research is one of the important methods to study the influence of dividend issuance policy on the changes in share price and transaction volume, and its basic principle is: assuming the market is effective, and the influence of relevant events (referred to as the dividend policy of listed company in this article) will be immediately reflected in the changes in share price and transaction volume. Therefore, the influence of dividend policy in the listed company may be inferred from the fluctuation of share price and transaction volume observed in a relatively short time. In this article, it means to check whether there is an abnormal price/transaction volume (AR) and accumulative average abnormal price/transaction volume (CAR) by calculating the difference of actual share price/turnover from the normal price/transaction volume in the sample companies before and after the date of dividend announcement (namely the time window).

(2) Sample selection. This article takes the events that A stock of all the listed banking companies (16 in total) issued dividend (including cash, stock and mixed dividend) in the CSI stock market for 5 years from 2008 to 2012 as the investigation samples. The year 2008 is selected as the start point because the equity division reform in Chinese listed company was declared to be basically completed at the end of 2007, and the dividend policy of Chinese listed company gradually stepped towards standardization thereafter; We select all the banking companies (A stock) in the CSI stock market as the samples because the dividend policy based on this block is typical in Chinese stock market, basically reflecting the overview and operation conditions of the whole Chinese stock market. There is little research on a whole block of listed companies as the samples for several continuous years, so it is another innovative point for this article.

(3) Selection of announcement date of dividend event In Chinese stock market, the information about dividend allocation will be generally announced for three times, so the selection of announcement date is always in confusion. For example, Gang Wei (1998) used the release date of annual report as the announcement date; Qiao Yu, Ying Cheng (2001) used the date when the dividend policy was officially released as the announcement date. The information of dividend policy allocation appeared in the annual report for the first time, and in the resolution of shareholder meeting for the second time. There were other important information about many other companies in those two announcements, so we cannot efficiently abstract the effect of dividend policy therefrom, and this article will not use those dates. The third appearance of dividend information happened in an announcement of annual dividend allocation policy specially released by a listed company and it contained no other information, so we select the date when this announcement was published in the newspaper specified by China's Securities Regulatory Commission as the announcement date of dividend event. The individual share price (closing price), transaction volume and other data are from the database in Shenwan website.

(4) Standard of screening the sample data: A. The listed company shall have 30 days of transaction before the announcement date of dividend event in order for us to have sufficient data to calculate the normal price/transaction volume; B. There shall be at least 5 working days between the announcement date of dividend event and the ex-dividend date so as to exclude the influence of the latter date; C. There shall be no announcement of other event of this company in the announcement date of dividend event so as to avoid the influence of other factors. We have 54 sets of data after the above standard screening process.

(5) Selection of event window: an event window shall be confirmed at first to weigh the

influence of an “event” on the fluctuation in the stock market. The (-1,+1) is mostly used as an event window in the western research, but we think this interval is too narrow. In Chinese literatures, there’s no agreement on the time dimensions of the dividend event window. For example, Gang Wei (1998) used [-5, 5]; Qiao Yu, Ying Cheng (2001) used [-10, 10]; Xinyuan Chen (1999) and Yongping Gui (2011) both used [-10, 20]; and Xiao Chen et al (1998) used [-20, 20]. This article takes the announcement date of dividend event as a center, defines the announcement date as the 0th day and the 10 days before and 20 days after the announcement date as the event window (31 days in total), namely [-10, 20]. Such a long event window we select may comprehensively reflects the influence of dividend event on the stock price/turnover, and the representativeness and result of analysis for this data are both high. But it may also be disturbed by some irrelevant factors of other events, such as the ripple effect, which will be subject to exclusion analysis thereafter.

(6) Measurement of normal price/transaction volume: the normal price/transaction volume refers to the price/transaction volume that may be estimated if the dividend policy is not released. The calculation methods mainly include the constant mean model, method model, constant returns model, market adjustment model, etc.. The previous proof indicates there’s no big difference in direction and significance in the result of short-term event from research conducted by the above several models, except for some variance in quantity. This article uses constant mean model to estimate the normal price/transaction volume when the time window is not affected by the dividend issuance event.

The constant mean model is to select a particular period before the event window to calculate the average price/transaction volume of the sample company in that period and take it as an expected value of normal price/transaction volume. In this article, we select the data within [-30, -11] to calculate the average price/transaction volume. It is for the *i*th stock in the sample, and the formula is:

$$\hat{R}_{it} = \frac{1}{30 - 11 + 1} \sum_{t=-30}^{t=-11} R_{it} \tag{1}$$

(7) Measurement of abnormal price/transaction volume: we calculate the abnormal price/transaction volume because the announcement of dividend policy brings a short-term fluctuation in the stock market, thus naturally measures the influence of dividend policy announcement on the stock price/transaction volume, which is the nature of event research method. So we subtract the normal price/transaction volume from the actual price/transaction volume after the event, and we get the abnormal price/transaction volume. Therefore we have the following abnormal price/transaction volume AR_{it} of sample stock *i* in the *t*th day, and the formula is:

$$AR_{it} = R_{it} - \hat{R}_{it} \tag{2}$$

(8) Measurement of average abnormal price/transaction volume: weigh the average abnormal price/transaction volume of *N* number of events sample stock in *t*th day, and the calculation formula is:

$$AAR_t = \frac{1}{N} \sum_{i=1}^N AR_{it} \tag{3}$$

(N is the number of samples)

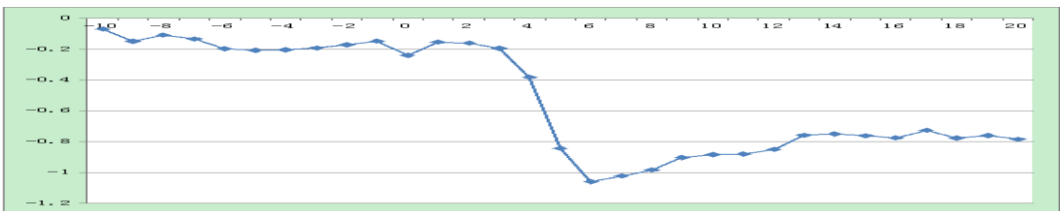


Figure 1. Average abnormal price

Unit: yuan

Figure 1 shows the rule of variation of average abnormal price AARt curve with the change of time for all the stocks in the time window sample; The announcement of dividend policy has a negative impact on the stock price, and it is not significant within [-10, 5]. But it starts to have great influence on the fifth day after the dividend announcement.

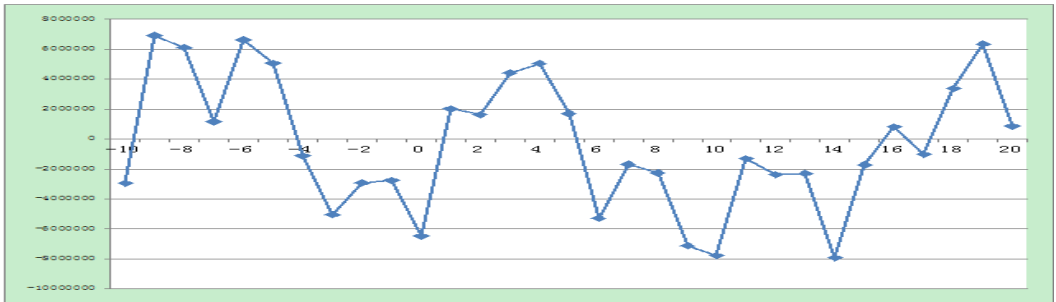


Figure 2. Average abnormal transaction volume

Unit: stock

Figure 2 shows the rule of variation of average abnormal transaction volume AARt curve with the change of time for all the stocks in the time window sample; Before the date of dividend announcement, the average abnormal transaction volume generally presents a decline, and gradually shows increasing trend after the date of dividend announcement, with daily transaction volume significantly over the daily average transaction volume in normal period. It reaches the peak in the fifth day from the announcement date, indicating the abnormal transaction volume exists indeed after the announcement date of dividend policy, and the declaration of dividend policy actually has an impact on the transaction volume in the stock market.

(9) Measurement of accumulative average abnormal price/transaction volume: weigh the abnormal price/transaction volume averagely obtained by N number of event samples within [-10, 20]:

$$CAR_{[-10,20]} = \sum_{t=-10}^{t=20} AAR_t \tag{4}$$

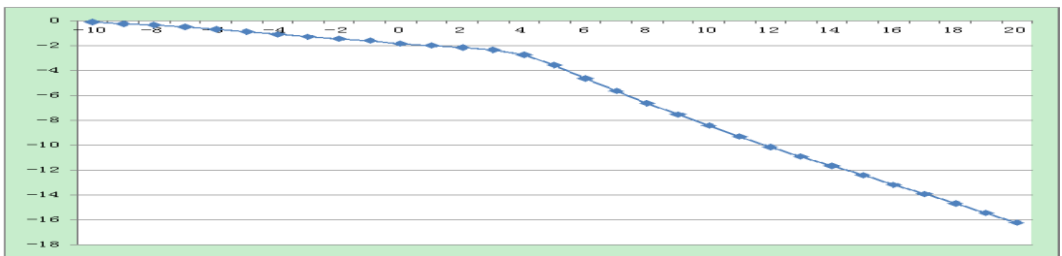


Figure 3. Accumulative average abnormal price

Unit: yuan

Figure 3 shows the rule of variation of accumulative average abnormal price CARt curve with the change of time for all the stocks in the time window sample; consistent with the conclusion in Figure 1.

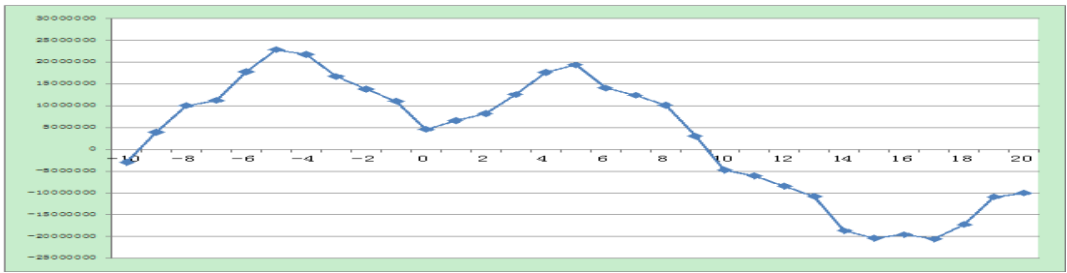


Figure 4. Accumulative average abnormal transaction volume

Unit: stock

Figure 4 shows the rule of variation of accumulative average abnormal transaction volume CART curve with the change of time for all the stocks in the time window sample; consistent with the conclusion in Figure 2.

(10) Descriptive statistics before and after the release of dividend announcement: the descriptive statistics (see the following form) are conducted based on the estimated obtainment of average abnormal transaction volume AARt and accumulative average abnormal transaction volume CART to determine whether there's a change after the release of dividend policy. And this will be used to judge whether the release of dividend policy has an impact on AARt and CART.

Table 1. Descriptive statistics of abnormal transaction volume

	Overall AARt	AARt before announcement	AARt after announcement	Overall CART	CART before announcement	CART after announcement
Average	-323812.25	1106039.33	-933191.97	2829903.76	12641132.57	9938283.07
Median	-1115095.69	27745.01	-25090.06	6586170.47	12518084.91	11276214.50
Standard deviation	4398975.85	4657920.98	4629876.41	13774711.63	7920967.34	7130334.27
minimum	-7929171.24	-5049973.17	-7778558.36	-20608573.44	-2960787.69	-4758472.21
maximum	6906669.42	6906669.42	5043472.98	22906390.61	22906390.61	19375807.50
Observed number	31	10	10	31	10	10
Confidence level (95.0%)	1613557.36	3332075.93	3312014.05	5052605.00	5666318.68	5100733.85

Note: interval before the announcement: [-10, -1]; interval after the announcement: [1, 10].

As shown in each data in Form 1, there are differences in the average abnormal transaction volumes and accumulative average abnormal transaction volumes both before and after the date of dividend announcement;; and there are also differences in the data and overall data both before and after the date of announcement. Therefore, it can not be denied that the announcement of dividend policy actually has an impact on the relevant transaction volume.

(11) Significance test (t inspection of a single sample) for CART: for the hypothesis inspection of accumulative average abnormal price/transaction volume, we use the statistical method in the time sequence perspective to inspect whether the mean value in the event window is significantly equal to 0 in order to determine whether the release of dividend policy has an obvious impact on the relevant stock price/transaction volume. Then we carry out t inspection for CART. Assuming: $H_0: CART=0$; or $H_1: CART \neq 0$

As shown in the inspection result in Table 2, the t inspection for CART refuses the original hypothesis, namely the mean value of accumulative average abnormal price is significantly not equal to 0, and the release of dividend policy has a significant impact on the stock price.

Table 2. Significance test for accumulative average abnormal price

Event window	Mean value	Difference of mean value	Standard deviation	T(CARt)
(-1 ~+1)	-1.79	-1.79	0.20	-15.76
(-2 ~+2)	-1.79	-1.79	0.28	-14.06
(-3 ~+3)	-1.78	-1.78	0.38	-12.32
(-4 ~+4)	-1.81	-1.81	0.53	-10.25
(-5 ~+5)	-1.88	-1.88	0.78	-7.98

Note: the inspected value of t inspection for the above single sample is 0.

Table 3. Significance test for accumulative average abnormal transaction volume

Event window	Mean value	Difference of mean value	Standard deviation	T(CARt)
(-1 ~+1)	7406670.43	7406670.43	3320396.32	3.86
(-2 ~+2)	8851111.30	8851111.30	3653848.25	5.42
(-3 ~+3)	10517864.26	10517864.26	4291028.92	6.49
(-4 ~+4)	12565332.14	12565332.14	5601509.43	6.73
(-5 ~+5)	14124562.49	14124562.49	6144852.61	7.62

Note: the inspected value of t inspection for the above single sample is 0.

As shown in the inspection result in Table 3, the t inspection for CARt refuses the original hypothesis, namely the mean value of accumulative average abnormal transaction volume is significantly not equal to 0, and the release of dividend policy has a significant impact on the transaction volume.

(12) Research result of the event and analysis on its reasons: we found from the above research that : A. The dividend policy has a negative impact on the share price. We think it is because: firstly, the listed banking company has a low level of dividend payment, with 0.1-0.2 yuan in average for each issued stock; secondly, the dividend is mostly paid in cash, but Chinese government will collect 10% of dividend tax from the cash dividend, which greatly reduces the actually obtained cash dividend for the investors, so they are not interested in cash dividend; thirdly, our current Chinese investors hold the shares mainly to earn the margin from short-term capital, which is of high market speculation. And they are not interested in the little profits from the dividend; fourthly, the market responses are concentrated near the fifth day after the dividend announcement, indicating there are some short-term investors that use the dividend policy for speculation, and they will sell off the stocks after gaining profits, which induces great decline in the share price. B. After the announcement date of dividend policy, the daily turnover will be significantly more than average daily turnover, which produces excessive transaction volume. We can conclude that: the announcement of dividend policy has a significant impact on the transaction volume in the stock market. There is excessive transaction volume 1-5 days after the dividend announcement and it reaches the peak near the fifth day, which is consistent with the situation where we found the dividend policy starts to have a significant impact from the fifth day. It may be caused by the following two reasons: firstly, the investor will choose to sell off the stocks after the announcement date and before the ex-dividend date to reduce the tax burden; secondly, a certain degree of information speculation exists in the stock market, and the investor conducts a large number of speculative transactions when the listed company announces the dividend policy. C. The event date selected in this article is the official announcement date of dividend policy, namely the third official announcement without any unexpected content about the dividend policy. But we

still found the excessive income (either the price or transaction volume), which means the market has not totally digested two previous content of dividend policy and the stock market has its own rules for transaction.

(13) Interference exclusion analysis: in the above content, we mentioned the ripple effect at the ex-dividend date. If the frequent transaction activities start before the announcement date, the fluctuation of price and transaction during the announcement period will not be caused completely by the dividend announcement. The method to avoid this interference is to select an interval long enough between the announcement and ex-dividend date to exclude the ripple effect. This article has excluded the events with less than 5 transaction days between the announcement and ex-dividend date when selecting the samples. We found from the above data that: several days before the dividend announcement, there were no extremely abnormal fluctuation of price and transaction volume in the market, so the results obtained from the above calculation are not affected by the effect of ex-dividend date.

3 Summary

So far, this article has used the events that A stock of all the listed banking companies issued dividend in the CSI stock market for 5 years from 2008 to 2012 to prove the response of stock market to the dividend policy of listed company in the perspective of abnormal price and transaction volume in the stock market in a comprehensive and systematic manner. The research result shows the release of dividend policy indeed has a significant impact on the fluctuation of stock market, and the dividend policy can transmit the future information about the company, which complies with the signal transmission theory. The above conclusion provides assertive evidence for investor to adjust the transaction strategy, for listed company to improve the dividend policy and for securities supervisory institutions to perfect the supervision requirement.

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