

Williams (1985). The basic implication of the Signaling Hypothesis is that under the environment of asymmetric information, dividends can be used as a signal to convey information about the prospects of the firm to the market. Meanwhile, an abundance of studies initiate the empirical research to test the Signaling Hypothesis, suggesting mixed results and no consistent conclusions have been reached yet.

The majority of empirical studies have found that dividends changes have significant impact on stock market around the dividend announcement date, and dividend changes are accompanied by the changes in stock price in the same direction (Pettit (1972), Aharony and Swary (1980), Asquith and Mullins (1983), Healy and Palepu (1988), Michaely et al. (1995), Benartzi et al. (1997), Grullon et al. (2002), Liu et al. (2008), Al-Yahyaee et al. (2011), and so on). However, about the association between dividend changes and changes in stock price, regression analysis are usually be performed, but with both supportive results (such as Amihud and Murgia, Kato et al. (2002), Cheng et al. (2007), Al-Yahyaee (2011)) and contradictory findings (such as Conroy et al. (2000), Liu et al. (2008)) about the Signaling Hypothesis. Furthermore, as far as the information content conveyed by dividend changes to the market is concerned, the empirical results are also controversial and mixed. Signaling Hypothesis holds that dividend may convey information about the profitability and cash flows of a firm to the market, while the Mature Hypothesis (Grullon et al. (2002)) state that dividend changes convey the information about risks, investment opportunities, growth rate (dividend increases are accompanied with a decline in risk, less investment opportunities, and less growth rate). In addition, the empirical findings are more mixed about whether dividend changes may convey information about subsequent profitability (Benartzi et al. (1997), Nissim and Ziv (2001), Grullon et al (2005), Hanlon et al. (2007), Hussainey (2009), Choi et al. (2011)).

Besides, most of empirical studies are conducted based on the US market or other developed market, such as UK, Japan, German, and so on. The studies about the Signaling Hypothesis based on the emerging market are relative few. Particularly, in China, which is one of the fastest growing emerging markets with different characteristics of investors' behavior and ownership structure, there are few studies about the test of the Signaling Hypothesis. Most of the empirical studies stop at the examination of the short-run market reactions to dividend announcements by calculating the cumulative abnormal returns around the announcement day, and little work has been done to test the relationships with dividend changes and future earnings. Therefore, though the studies are based on the same US market, the empirical results about the Signaling Hypothesis are mixed and controversial. Furthermore, only few studies are based on China market, it

leaves a vast space for further testing the information content and signaling effect of dividends in China market.

Therefore, the purpose of this paper is to test the Signaling Hypothesis based on China market. First, the market reactions to dividend changes around dividend announcements are examined to test whether dividend changes have significant impact on stock prices. Next, the relation between dividend changes and changes in stock price is tested to investigate whether dividend changes are associated with the changes in stock price in the same direction. Finally, the information content of dividends is tested to investigate what kind of information (earnings, cash flows, investment opportunities, risks, growths) dividend changes may convey to the market, and verify whether dividend changes are informative about future profitability or not.

2 Data and Methodology

This paper uses a sample of dividend announcements made by A share's firms (Non-financial firms) listed in Shanghai Stock Exchange (SSE) over the period from 2002 to 2011. This paper focuses on pure cash dividends. Hence dividend announcements with stock dividends or mixed dividends (both cash dividends and stock dividends) are excluded to make sure the information content and signaling effect come from cash dividends. Then the corresponding data of financial statement (covering the period from 2000 to 2010), market returns (SSE Composite A Share Index returns) and stock returns (covering the period from 2000 to 2011) are also collected for analysis. All the data come from the CSMAR Database developed by GTA. The final sample is composed of 4472 events of dividend announcements, which are composed of 1201 observations of dividend increases, 1087 observations of dividend decreases, and 2184 observations of dividends with no change.

First, event study method based on the market model is employed to calculate the abnormal returns (AR) and cumulative abnormal returns (CAR) around the dividend announcement date for testing the market reactions to dividend changes, where the event day ($t=0$) is the announcement date of dividend proposals, the event window is 41 days from $t=-20$ to $t=20$ around event day, and the estimation window is 200 days from $t=-220$ to $t=-21$ before the event day ($t=0$). According to the Signaling Hypothesis, dividend changes are expected to be accompanied by the changes in stock price in the same direction (Aharony and Swary (1980), Asquith and Mullins (1983), Healy and Palepu (1988), Michaely et al. (1995), Benartzi et al. (1997), Grullon et al. (2002)). Hence, the hypothesis 1 is formed as follows.

Hypothesis 1: Dividend changes have significant impact on stock price around the dividend announcements, that is, there are significantly positive (negative) AR and CAR around the announcements of dividend increases (decreases).

Second, regression model is designed to examine the association between dividend changes and changes in stock prices.

$$CAR_{it} = \beta_0 + \beta_1 \Delta DIV_{it} + \beta_2 \Delta EPS_{it} + \beta_3 SIZE_{it} + \beta_4 RISK_{it} + \varepsilon_{it} \quad (1)$$

CAR is the cumulative abnormal returns for different event windows, such as [-5, 0], [-3, 1], [-1, +1], [-2,+2], [-3, +3] (the three-day CAR is focused, and other windows are tested for the robustness); ΔDIV is a proxy for the unexpected changes in dividends, measured by the change of dividends per share scaled by the stock price on one day prior to the announcement day (Amihud and Murgia (1997), Al-Yahyaee et al. (2011), Bozos et al. (2011)). As dividends and earnings are announced on the same day in China, ΔEPS is used to control the effect of earnings on CAR. ΔEPS is measured as the change of earnings per share scaled by the stock price on one day prior to the announcement day (Amhud and Murgia (1997), Al-Yahyaee et al. (2011), Bozos et al. (2011), and the sign of coefficient on it is expected to be positive. Besides, since the information asymmetry is more sever in small firm than that of large firm, it tend to have surprise when the information is announced to the market. Hence firms of small size tend to have larger CAR (Kato et al. (2002)). Therefore, SIZE, measured as the nature logarithm value of total assets, is a proxy for the size of a firm to control for the effect of size on CAR, and a negative sign is expected. In additions, following Cheng et al. (2009), RISK is added to the model to control for the impact of risks on the CAR, which is measured by the standard deviation of residual between actual return and estimated expected return from the market model over 200 days from $t=-220$ to $t=-21$, and a negative coefficient is expected. Therefore, according to the Signaling Hypothesis, hypothesis 2 is formed in the following.

Hypothesis 2: The changes in stock price are positively associated with the dividend changes. In other words, the coefficient on ΔDIV in model 1 is expected to be significantly positive.

Third, regression analysis is performed to test what kind of information dividend

changes convey to the market, such as earnings, cash flows, investment opportunities, risks and growth rate.

$$\Delta \text{DIV}_{it} = \beta_0 + \beta_1 \Delta \text{ROA}_{it} + \beta_2 \Delta \text{OPCF}_{it} + \beta_3 \Delta \text{AMB}_{it} + \beta_4 \Delta \text{DEBT}_{it} + \beta_5 \text{GROWTH}_{it} + \sum_{j=6}^{16} \beta_j \text{INDUSTRY}_{ij} + \varepsilon_{it} \quad (2)$$

ΔDIV is the same as explained in model (1). ΔROA , as a proxy for profitability, is the change in return on assets, measured as the difference of return on assets between announcement year and one year before the announcement year. ΔOPCF is a proxy for the change in cash flow, measured as the difference of net operating cash flow scaled by total assets between announcement year and one year before the announcement year. ΔAMB is measured as the difference of market-to-book ratio of equity between announcement year and one year before the announcement year, representing for the change of investment opportunities (the larger the market-to-book ratio of equity is, the higher growth and the less investment opportunities it is); ΔDEBT is a proxy for financial risk, measured as the difference of debt ratio of total liabilities to total assets between announcement year and one year before the announcement year (a high debt ratio implies a high financial risk); GROWTH is measured by the growth rate of total assets for announcement year; INDUSTRY is added to the regression model to control for the industry effects on dividend policy. Earnings (ΔROA) and cash flows (ΔOPCF) are used for testing the Signaling Hypothesis, and the investment opportunities (ΔAMB), risks (ΔDEBT) and growth rates (GROWTH) are used for testing the Mature Hypothesis (Grullon et al. (2002)).

Hypothesis 3: If the Signaling Hypothesis is supported, dividend changes are positively associated with the change of earnings and cash flows, hence significantly positive coefficients on ΔROA and ΔOPCF are expected. If the Mature Hypothesis is valid, dividend changes are negatively associated with the change in risks, investment opportunities and growth, thus significantly negative coefficients on ΔAMB , ΔDEBT , and GROWTH are expected.

Finally, the basic model of Nissim and Ziv (2001) is used to investigate whether dividend changes are informative about future earnings.

$$(E_t - E_{t-1}) / B_{t-1} = \beta_0 + \beta_1 R \Delta \text{DIV}_0 + \beta_2 \text{ROE}_{t-1} + \varepsilon_t \quad (3)$$

The dependent variable $(E_t - E_{t-1}) / B_{-1}$ is a proxy for future changes in earning, which represent the earning changes for one year after dividend changes ($t=1$), and earning changes for the second subsequent year ($t=2$) respectively. It is measured as the changes in earnings deflated by the book value of equity at the end of previous year (one year before the dividend changes). The dependent variable $R\Delta DIV_0$ is measured as the change rate of dividends per share relative to previous year ($R\Delta DIV_0 = (DPS_0 - DPS_{-1}) / DPS_{-1}$). Following Nissim and Ziv (2001), ROE_{t-1} is return on equity in year $t-1$, which is added to the model as control variable.

Hypothesis 4: Dividend changes may convey information about future earnings. It is expected that there is positive relation between future changes in earnings and dividend changes.

In addition, dividend decreases seem have more signaling effects than dividend increases (Benartzi et al. (1997), Grullon et al. (2002), Michaely et al. (2005)), thus $DI \times R\Delta DIV_0$ and $DD \times R\Delta DIV_0$ are added to the model to test the asymmetric effect for dividend increases and dividend decreases as follows.

$$(E_t - E_{t-1}) / B_{-1} = \beta_0 + \beta_1 DI \times R\Delta DIV_0 + \beta_2 DD \times R\Delta DIV_0 + \beta_3 ROE_{t-1} + \varepsilon_t \quad (4)$$

The variables of $(E_t - E_{t-1}) / B_{-1}$, $R\Delta DIV_0$ and ROE_{t-1} are the same as described in model (3). DI (DD) is a dummy variable that equals to one for dividend increases (decreases) and zero otherwise. Thus, the independent variables of $DI \times R\Delta DIV_0$ and $DD \times R\Delta DIV_0$ are used as proxies of changes rate respectively for dividend increases and dividend decreases, then the coefficients on them can be examined to test the asymmetric effect of signaling about the future profitability of the firm.

Hypothesis 5: The effect of the informativeness about the future earnings is asymmetric for dividend increases and dividend decreases, and the coefficient on $DD \times R\Delta DIV_0$ is expected to be significantly larger than that on $DI \times R\Delta DIV_0$.

3 Conclusions and Innovations

By examining the information content and signaling effect of cash dividends by using a sample of dividend announcements made by A share's firms listed in SSE, this paper suggests meaningful and significant results as follows.

First, by testing the market reactions to dividend changes using event study method based on the market model, the ARs on the event day are significantly negative for the total sample and subgroups (dividend increases, dividend decreases, and dividends with no change), and we cannot find significant difference among the groups. A possible explanation is that the market has expectation about dividends and earnings previously, and feels disappointed at the actual numbers (which are far away from the expected numbers) when they are announced. Then the negative ARs occur on the announcement day. Besides, the significant positive ARs prior to announcement day for dividend increases suggest that dividend increases have positive effects on the stock price and the “good news” tend to leak to the market previously. By examining the CARs around dividend announcement, though they remain negative, the CARs are larger (less negative) for dividend increase than those for dividend decreases and dividends with no change. Hence, the findings show that dividend changes have significant impact on stock price, in other word, dividend increases have “positive effects” on stock price while dividend decrease have “negative effects” on the stock price, which are consistent with hypothesis 1.

Second, the association between dividend changes and changes in stock price is examined by regression model (1), and the results are supportive to Amihud and Murgia (1997), Cheng et al. (2007), and Al-Yahyaee et al. (2011), but contrary to Conroy et al. (2000) and Liu et al. (2008). Consistent with the Signaling Hypothesis, the significantly positive coefficients on unexpected changes in dividends both for univariate and multivariate analysis suggest the signaling effect of dividend changes, that is, dividend changes are associated with the changes in stock price in the same direction.

Third, regression models (2) are used to test what kind of information dividend changes may convey to the market. The results show that dividend changes are significantly positive related to the changes in profitability and cash flows, which is consistent with the Signaling Hypothesis. Meanwhile, the insignificant or contradictory relations between dividend changes and the changes in market-to-book value of equity, debt ratio and growth rate of total assets suggest that dividend changes seem difficult to convey information about investment opportunities, risks, and growth rate of a firm, which is contrary to the Mature Hypothesis (Grullon (2002)). Therefore, the findings are more supportive to the Signaling Hypothesis than the Mature Hypothesis.

Fourth, in order to further test the Signaling Hypothesis, the regression models (3) are used to test whether dividend changes are informative about future profitability of the firm. The positive relations between future earning changes and dividend changes for both $t=1$ and $t=2$ suggest that dividend changes can predict future earnings. However, for the

second subsequent year after dividend changes, the relations become weak and insignificant, which suggest that dividend changes are informative about future profitability at least one year after the dividend changes. The finding is consistent with hypothesis 4, and partly supportive to Nissim and Ziv (2001), but contrary to Benartzi et al. (1997) and Grullon et al. (2005).

Finally, this paper also tests whether the informativeness of dividend increases and dividend decreases for future earnings is asymmetric or not. The regression results for model (4) suggest that both of dividend increases and dividend decreases can convey information about future earnings at least one year, further supporting the results in model (3). Besides, though the coefficients for dividend decreases are slightly larger than those for dividend increases, we cannot find evidence that the differences between the two are significant. The findings are contrary to Benartzi et al. (1997) and Nissim and Ziv (2001). Thus we cannot find evidence to support that the informativeness about future earnings is asymmetric for dividend increases and dividend decreases. A possible explanation is that dividends have less characteristics of dividend smoothing in China than those in US, as managers in the US are more reluctant to cut dividends.

The innovations of this paper are listed in the following. First, it is the first study to use large sample during long period of ten years (2002~2011) in China market to test the Signaling Hypothesis. Although some studies have examined the market reactions to dividend changes in China market, short period is usually used, such as five years or even less (Chen et al. (2002), Li and Liu (2006) and Chen et al. (2011)). Besides, this paper is the first one to test the Signaling Hypothesis in China by using various methods and models from relatively comprehensive aspects. Related studies based on China market focus on the market reactions to dividend announcements, without further test about the information content and the informativeness of future profitability. Finally, it is the first one to provide empirical evidence to support the Signaling Hypothesis in China market. It is well documented that dividend changes are associated with the changes in stock price in the same direction according to related studies based on the US market. However, the results about the information content of dividends are mixed. In addition, related studies in China often find evidence that cash dividend are unfavorable, which is contrary to the Signaling Hypothesis. Therefore, this paper demonstrates significant results that dividend changes are not only associated with changes in stock price in the same direction, but also informative about both current and future earnings (at least one year after dividend changes), which is the main research contribution of this paper.

However, there are some limitations in this paper and some work is still left for

future research to test the Signaling Hypothesis more comprehensively. Compared with the market model, the matching firm (control firm) method can also be used to estimate the short-run abnormal returns, and meanwhile the long-run abnormal returns are needed to be tested by using three-factor model, matching firm method, or buy-and-hold returns (Michaely et al. (1995), Cheng et al. (2007), Liu et al. (2008)) to verify the signaling effect. Besides, about whether dividend changes may convey information about future profitability, other models, such as the nonlinear model suggested by Grullon et al. (2005), are needed to be tested in detail instead of linear model of Nissim and Ziv (2001). In addition, this paper divides dividend changes into three groups, dividend increases, dividend decreases, and dividends with no change, without considering the extreme changes for initiations and omissions. Thus further work is needed to conduct to test the information content and signaling effect more comprehensively.

論文審査結果の要旨

本論文は、中国上場企業の現金配当がもたらすシグナリング効果を分析した実証研究である。経営者と株主の間に存在する情報の非対称性の下で、配当政策は企業の将来の業績予想を株式市場に伝える役割がある。これは配当に関するシグナリング仮説と呼ばれる。

本研究では、2002年から2012年までの期間について上海証券取引所のA株式上場企業を対象とし、配当のシグナリング効果について以下の包括的分析を行っている。(1) 配当の公表日前後10日間の平均異常収益率の分析、(2) 公表日前後数日の平均累積異常収益率に影響を与える要因、(3) 配当の変化が伝える情報内容、(4) 今期の配当変化が1年後や2年後の利益変化情報を含むか、である。(1)は、増配企業、減配企業、不変企業の3グループに分けて分析しているが、公表日にはいずれも有意にかつ大きい負の平均異常収益率が観察された。これは、先行研究にはない独自の結果である。なお、増配企業については、公表日前に正の異常収益率が観察された。(2)では、公表日前後の累積異常収益率は、利益の変化ではなく、配当の変化による影響を大きく受けることが明らかにされる。また、先進国市場とは逆に、企業規模が大きいほど累積異常収益率が大きいことがわかった。(3)では、配当変化が総資産利益率変化および総資産営業キャッシュフロー比率変化という情報を反映する、すなわち情報内容として含むことが観察された。最後に、(4)では、去年から今年にかけての配当変化と1年後、2年後の利益変化の関係を見ると、1年後の利益変化は予想するが、2年後の利益変化とは無関係であることが観察された。また、配当の増加と減少が将来利益変化を予想する程度は、減少の場合の方が大きいという非対称性が存在することもわかった。

本研究は、分析期間の長さ、データの多さ、包括的分析という点で、中国株式市場に関するこの

種の分析として類を見ないものである。また、配当公表日当日に大きい負の異常収益率が観察されるという興味深い事実を筆頭にいくつかの新しい事実を発見している。

以上より本論文は博士（経営学）論文として「合格」と判定する。