DIVIDEND CAPTURE ON THE EX-DIVIDEND DAY: EVIDENCE FROM VIETNAMESE STOCK MARKET

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ABSTRACT

Vietnamese stock market is a promising laboratory to investigate the ex-day behaviour of stock price due to its special features: Firstly, the market uses periodic call auction mechanism for determining both opening and closing prices and there is no market maker. Secondly, tick size is much smaller than dividend amount. These imply that market microstructure theories are not applicable explanations. Thirdly, unlike many markets' taxation of capital gains and dividends, there is no considerably preferential treatment of capital gains to dividends. Finally, short-selling is prohibited. Comparing the observed values of price drop to dividend ratio and their expected values under the impact of tax policy, we find that tax treatment fails to explain the anomaly in the research framework. The research findings show that abnormal returns are significantly positive and negative in the pre- and the post ex-dividend day periods, respectively. Moreover, regression results and relevant analysis show supporting evidence for dividend capture theory.

Keywords: dividend capture, ex-dividend, stock price, Vietnam, event study

INTRODUCTION

Ex-dividend day anomaly of stock price is one of the most debatable issues in corporate finance with several theoretical and empirical studies in various institutional environments. Miller and Modigliani (1961) posit that in a perfect stock market without taxes, transaction costs and risk, stock prices should drop precisely by dividend amount on the ex-dividend day. However, many prior studies conducted in both developed and emerging markets show that the price drop is different from the dividend magnitude. There are three categories of theory on ex-dividend behavior of stock price. Firstly, tax clientele theory explains the difference between the stock price drop on the ex-day and the dividend paid only by tax treatment of capital gains to dividends. Secondly, short-term trading theory argues that tax indifferent arbitrageurs are marginal investors in the market; therefore, profit opportunities are exploited until the difference is equal to transaction costs. Thirdly, market microstructure theories explain ex-day price behaviour with non-tax market frictions including limit order adjustment, price discreteness and bid-ask bounce. The explanatory power of these theories significantly relies on the institutional environment of a stock market.

Although Vietnamese stock market is small and emerging, it is a promising laboratory to examine ex-day behaviour of stock price because of its institutional environment regarding trading regulations and tax policy. Firstly, the market uses periodic call auction mechanism for determining both opening and closing prices and there is no market maker. Secondly, unlike many markets' taxation of capital gains and dividends, there is no considerably preferential treatment of capital gains to dividends. Finally, short-selling is prohibited. Therefore, tax-induced hypothesis and dividend capture hypothesis are possible to explain the ex-day behaviour of stock price. However, after comparing the observed values of price drop to dividend ratio and their expected values under the impact of tax policy, we conclude that tax treatment fails to explain the anomaly in the research frame work and only dividend capture hypothesis is applicable.

LITERATURE REVIEW

Elton and Gruber (1970) initially proposed tax clientele theory stating that ex-day behaviour of a firm's common stock should be associated with its marginal stockholders' tax rates. An investor selling his stocks before the ex-day loses the right of receiving dividends. However, if he holds them until they go ex-dividend he should expect to sell them at lower price due to his dividend retention. This stockholder is indifferent to the time of selling his stocks only if the benefits from

two cases are equal. Accordingly, Elton and Gruber (1970) develop the following expression:

$$\frac{P_c - P_e}{D} = \frac{1 - t_d}{1 - t_g} \qquad (1)$$

Where P_c is stock price on the last cum-day, P_e is expected stock price on the ex-day, t_d is the marginal tax rate on dividends, t_g is the marginal tax rate on capital gains and D is the magnitude of dividend.

Subject to this analysis, the ratio of price drop to dividend $(P_c - P_e)/D$ always reflects the comparative marginal tax rates on stockholders' dividends and capital gains. Elton and Gruber (1970) posit that the relative marginal tax rates can be inferred by studying the stock price drop to dividend ratio on the ex-dividend day. In their model, marginal investors are long-term investors whose decisions of buying or selling are irrelevant to dividends.

However, Kalay (1982) argues that in the absence of the tax clientele effect (i.e. tax rates on dividends and capital gains are equal), there are investors who are different to the timing of sale and trade due to dividends. In this case, transaction costs become relevant to the price drop to dividend ratio. If the expected price drop on the ex-day exceeds the dividend per share by more than the costs of buying and selling stocks, investors could short-sell their stocks on cum-dividend days and buy them back when they go ex-dividend to make a profit. This can be presented as follows:

$$(1 - t_o)(P_c - P_e - D - \alpha P) > 0 \qquad (2)$$

Where t_o is tax rate on ordinary income. α is transactions costs of a round-trip transaction. $P = (P_c + P_e)/2$

On the other hand, if the expected price drop on the ex-day is less than dividend per share by more than transaction costs, investors tend to buy stocks on cum-dividend days and sell them on ex-dividend days to gain a profit. This can be expressed as follows:

$$(1 - t_o)[D - (P_c - P_e) - \alpha P] > 0 \qquad (3)$$

According to Kalay (1982), a profit is realised only if it is not exploited by arbitrage activities. As a result, the condition of non-profit opportunities is presented as follows:

$$| D - (P_c - P_e) | \leq \alpha P \qquad (4)$$

Rearrange (4) we get

$$1 - \frac{\alpha P}{D} \leq \frac{P_c - P_e}{D} \leq 1 + \frac{\alpha P}{D} \tag{5}$$

Accordingly, stockholders' marginal tax rates cannot be estimated from the price drop to dividend ratio. If transaction costs are zero, the value of $(P_c - P_e)/D$ will be limited to unity.

Eades, Hess and Kim (1984) investigate the ex-dividend day behaviour of stock price on New York Stock Exchange from 2 July 1962 to 31 December 1980 and find that the preferential treatment of capital gains to dividends cannot explain completely abnormal returns on ex-dividend days. Consequently, one cannot infer marginal tax rates on dividends and capital gains from the ratio of stock price drop to dividend.

Moreover, ex-day stock price behaviour is also explained by market microstructure. Based on Rule 118 of New York Stock Exchange, Dubofsky (1992; 1997) argues that rounding down the price of existing limit buy orders to a multiple of a tick leads to less-than-one price drop to dividend ratio on the ex-dividend day. In addition, Frank and Jagannathan (1998) posit that investors consider dividends as a nuisance due to costs arising from dividend collection whilst market makers with lower collection costs tend to purchase stocks before ex-dividend days and resell them on ex-dividend days. Therefore, most trades are conducted at bid prices on cum-dividend days and at ask prices on ex-dividend days. These bid-ask spreads imply that price drops on ex-days are lower than dividend amounts. Furthermore, Bali and Hite (1998) argue that stock price behaviour on ex-dividend days is determined by price discreteness. If stock prices are restricted to discrete ticks and dividends are continuous, dividend amounts are always rounded down to ticks next to dividends. This adjustment makes in ex-day price drops less than dividend amounts in most cases. If tick size is larger, price drop ratio will be higher.

INSTITUTIONAL ENVIRONMENT

Vietnam stock market was established in July 2000 with Ho Chi Minh City Stock Exchange (HSX). Over the first five years from 2000 to 2005, financial activities in the market were not remarkable with only about 30 listed stocks; however, since 2006 more firms were listed and the market started to grow rapidly. In two years of booming, VN-INDEX increased dramatically from January 2006 to reach their peaks in March 2007 and maintained at high levels until the end of

2007 (Figure 1). After that, the market plunged into recession during the year of 2008. Despite a slight recovery in 2009, Vietnamese stock market continued its downward trend in the two following years. Until 31 December 2011 there were 301 firms listed in HSX and their market capitalisation is equal to about 17% GDP.
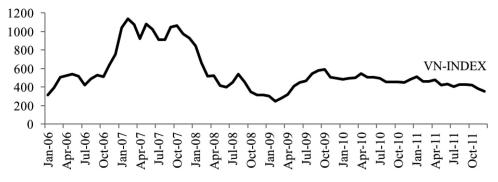

Figure 1. Performance of VN-INDEX from 2006 to 2011

Although Vietnamese stock market is small and emerging, it is a promising laboratory to investigate ex-dividend day behaviour of stock price due to its special characteristics concerning trading regulations and taxation of dividends and capital gains.

Trading Regulation

According to Vietnam Enterprise Law, dividend payment is not mandatory and there is no regulation on number of payment per year. Firms can retain 100% earnings or distribute their earnings in various forms including cash dividends, stock dividends and share repurchases. Like other emerging markets, Vietnamese stock market witnessed a high percentage of dividend payers which is over 80% from 2006 to 2011. Moreover, like in the U.S. market firms listed in Vietnamese stock market can pay cash dividends more than once a year (i.e. semi-annually, three times a year or quarterly).

Vietnamese stock market is a pure auction market in which trading activities are conducted via securities companies. Apart from playing the role of brokers, securities companies can buy and sell stocks on their accounts. Unlike in the U.S. market, securities companies are considered as normal investors and there is no market maker in Vietnamese stock market. Orders are initiated from securities companies through computer terminals on their premises or on the exchange floor. Brokerage fees for successful stock transactions depending total daily transaction value and transaction methods commonly vary from 0.15% to

0.35% of transaction value. In addtion, sellers and buyers are likely to pay other fees for legal service, consutlting service, portfolio management service, etc. as transaction costs.

Furthermore, short-selling is prohibited by Vietnam Securities Law. Settlement cycle on Ho Chi Minh City Stock Exchange is T+3. Buyers actually receive their stocks three days after the day of transaction. If stocks are sold on the ex-dividend day, seller receive dividends.

Table 1
Price range for buy and sell orders in Ho Chi Minh City Stock Exchange from 2006 to 2011

Period	Price range
From 1 January 2006 to 26 March 2008	P_r +/− 5%
From 27 March 2008 to 6 April 2008	P_r +/− 1%
From 7 April 2008 to 15 June 2008	P_r +/− 2%
From 16 June 2008 to 17 August 2008	P_r +/− 3%
From 18 June 2008 to 31 December 2011	P_r +/− 5%

P_r is reference price of day t which is equal to closing price of day $t - 1$ if day t is not an event day and adjusted closing price of day $t - 1$ otherwise. Event days include ex-right days and most recent trading days after stock split and reverse stock split.

Moreover, prices from buy and sell orders in a trading day t are constrainted to a price range from price floor to price ceiling based on reference price which is equal to closing price of day $t - 1$ if day t is not an event day (Table 1) and adjusted closing price of day $t - 1$ otherwise. The ex-dividend day is an event day and the reference price is equal to the last cum-day's closing price minus dividend amount. Unlike Hong Kong stock market where closing price is determined with continuous auction mechanism, Vietnamese stock market uses periodic call auction mechanism for determining both opening and closing prices. During the call auction, the price is set with the first priority of largest transaction volume and the second priority of closest with nearest matching order price. As a result, ask-bid spread is absent. The two features including no ask-bid spread and no market maker indicate that Frank and Jagannathan's microstructure hypothesis fails to explain behaviour of stock price on ex-dividend days in Vietnamese stock market. In addition, contrary to NYSE Rule 118, HSX trading rules state that all of limit orders shall be cancelled at the end of closing trading session. Thus, there is no limit order adjustment for the next trading day which implies Dubofsky's model is not applicable.

Like New York Stock Exchange, Ho Chi Minh City Stock Exchange adjusts reference price on the ex-dividend day by rounding it down to the next tick. There are three levels of tick size, namely 0.1, 0.5 and 1.0 coresponding to three classes of stock price (Table 2).

Table 2
Tick size in Ho Chi Minh City Stock Exchange

Stock prices (1000 VND)	0.0 < stock price ≤ 49.9	50 ≤ stock price ≤ 99.5	stock price ≥ 100
Tick size (1000 VND)	0.1	0.5	1.0

Taxation of Dividends and Capital Gains

Although Vietnam's tax policy on dividends and capital gains is complicated and adjusted four times during the period from 2006 to 2011, it shows that generally there is no significantly preferential treatment of capital gains to dividends which is evident in several markets examined by prior studies (Table 3). In the first sub-period from 2006 to 2009, both dividends and capital gains earned by individual investors were exempt from tax while Vietnamese institutional investors' capital gains are charged 28% between January 2006 and December 2009. In the second sub-period, Vietnamese institutional investors' capital gains are taxed at 25%. Individual investors' dividends were taxed at the rate of 5% and they could choose to pay 20% of capital gains or 0.1% of selling price during the period from January 2010 to July 2011. Although individual investors registered to pay 20% of capital gains, they had to pay 0.1% of selling price at the time of transaction as a temporary tax payment and they would finalise their tax payment with the registered rate at the end of each year. From August 2011, in order to support and encourage investment from invidual investors in economic recession, Vietnamese government decreased tax rates for their dividends and capital gains to 0% and by 50% respectively. Remarkably, over the whole research period, foreign institutional investors only paid a flat tax rate of 0.1% of selling price. Unlike in the U.S. market, dividends are not charged any taxes after taxed at such rates. In all cases, the flat tax rate on selling price can be considered as transaction cost.

RESEARCH DESIGN

In line with prior studies, we investigate both stock price behaviour and trading volume around the ex-dividend day with the event study methodology to determine whether short-term traders are marginal investors on the ex-day. The former is

initially and commonly used but not enough to find marginal investors due to other factors (e.g. taxes, market liquidity), thus the latter is employed (Lakonishok & Vermaelen, 1986). Furthermore, OLS regression analysis investigating the relationship between dividend yield and abnormal return on the ex-day is also used to find evidence of marginal traders.

Table 3

Expected price drop to dividend ratios under the impact of tax policy from 2006 to 2011

Single marginal investors	Tax rate for dividends	Tax rate for capital gain	Expected price drop to dividend ratios
1st sub-period			
Individual investors	0%	0%	1.00
Vietnamese institutional investors	0%	28%[A] and 25%[B]	1.39[A] and 1.33[B]
Foreign institutional investors	0%	0.1% of selling price	1.00
2nd sub-period			
Individual investors	5%[C] and 0%[D]	20% or 0.1% of selling price[C] and 10% or 0.05% of selling price[D]	1.19 if investors register to pay 20% capital gains, otherwise 0.95[C] and 1.01 if investors register to pay 20% capital gains, otherwise 1.00[D]
Vietnamese institutional investors	0%	25%	1.33
Foreign institutional investors	0%	0.1% of selling price	1.00

Notes: 1st sub-period is from January 2006 to December 2009; 2nd sub-period is from January 2010 to December 2011; [A] is from to January 2006 to December 2009; [B] is from January 2010 to December 2011; [C] is from January 2010 to July 2011; [D] is from August 2011 to December 2011.

Source: Circular No. 100/2004/TT-BTC, Law No. 09/2003/QH11, Law No. 14/2008/QH12, Law No. 04/2007/QH12, Circular No. 134/2008/TT-BTC, Decree No. 101/2011/ND-CP and Circular 160/2009/TT-BTC.

Ex-dividend Stock Price Behaviour

When making decisions of selling stocks on cum-dividend days or on ex-dividend days, investors face trade-off between the right to collect dividend payment and a decrease in stock price. If they sell stocks on cum-days, they lose the right. However, if they sell stocks on ex-days, they have to accept lower price (Elton & Gruber, 1970). In a perfect market without market frictions including taxes, transaction costs and risk, the difference between stock price on the last cum-day and the ex-day should be equal to dividend amount (Miller & Modigliani, 1961). This argument is presented in the following equation:

$$P_c - P_e = D \qquad (6)$$

Where P_c is closing price on the last cum-day and P_e is expected closing price on the ex-day.

Dividing both sides of the equation by dividend amount (D), we get the original definition of ex-day price drop ratio denoted as PDR_1:

$$PDR_1 = \frac{P_c - P_e}{D} \qquad (7)$$

According to Kalay (1982) and Naranjo, Nimalendran and Ryngaert (2000), closing price of a stock is significantly impacted by its daily normal return; therefore, this price should be adjusted. The most commonly used measure to adjust ex-day closing price in prior studies is daily market return (R_m). In this study, daily return of VN-INDEX is used as a proxy for daily market return. The market-adjusted ratio ($APDR_1$) is as follows:

$$APDR_1 = \frac{P_c - [P_e/(1 + R_m)]}{D} \qquad (8)$$

Moreover, it is more likely that using the price drop to dividend ratio leads to heteroscedasticity (Boyd & Jagannathan, 1994; Eades et al., 1984; Michaely, 1991). When dividend amount is used as a deflator, the weight allocated to changes in observations which have low dividends is extremely large. In line with Milonas, Travlos, Xiao and Tan (2006), we scale the ex-dividend day price drop by the stock price on the last cum-day and obtain the new ratio as follows:

$$PDR_2 = \frac{P_c - P_e}{P_c} \qquad (9)$$

Similarly, market-adjusted price drop is deflated by cum-day price.

$$APDR_2 = \frac{P_c - [P_e/(1 + R_m)]}{D} \qquad (10)$$

Moreover, following prior studies, we also investigate behaviour of stock price around ex-dividend days with event-study methodology proposed by Brown and Warner (1985). Event window to examine stock price behaviour is 21 days from Day –10 to Day +10 where the ex-day is considered as Day 0. Abnormal returns (AR) and cumulative abnormal returns (CAR) are computed based on an estimation window of 120 days starting from Day –130 and ending on Day –11. Estimation methods include market-adjusted return model and market model where VN-INDEX is used to measure daily market return.

According to Miller and Modigliani (1961), the price drop is equal to dividend amount in a perfect market. Therefore, the theoretical value of price drop ratios scaled by dividend amount is one, theoretical value of those deflated by cum-day price is dividend yield and theoretical value of abnormal returns is zero. In case the observed value of these measures are no equal to the theoretical ones, two theories including tax-induced clientele theory and transaction cost theory can explain behaviour of stock price due to the trading regulations of Vietnamese stock market presented. Firstly, if the stock price behaviour is affected by different taxation of dividends and capital gains, in consistence with Elton and Gruber's model illustrated in Equation (1), price drop to dividend ratios with corresponding single marginal investors are demonstrated in Table 3. In addition, although according to Elton and Gruber's original theory abnormal returns (ARs) on ex-days and cumulative abnormal returns (CARs) in the pre and the post ex-day period should be constrained to zero, the extensive analysis developed by Green (1980) shows that abnormal returns may be present on and around ex-days. Green (1980) argues that when delaying or advancing a transaction due to tax policy is expensive, investors charged with high tax rates tend to sell stocks on the last cum-day and buy stocks on the ex-day. This leads to positive abnormal returns and negative abnormal returns in the pre- and the post ex-dividend periods, respectively.

Secondly, if the stock price behaviour is impacted by transaction costs, possible marginal investors whose dividends and capital gains are charged at the same tax rate are individual investors (except over the period from January 2010 to July 2011) and foreign institutional investors due to tax policy. Moreover, most arbitrage trading activities are conducted to capture dividends (i.e. buying shares before ex-days and selling shares after ex-days) since short-selling is prohibited. This indicates that abnormal returns (ARs) and cumulative abnormal returns (CARs) are positive over the period before stocks go ex-dividend and negative after stocks go ex-dividend (Lakonishok & Vermaelen, 1986).

Moreover, when investors purchase shares before the ex-day and sell them after the ex-day, we have the following equation:

$$1 - \frac{\alpha P}{D} = \frac{P_c - P_e}{D} \qquad (11)$$

Rearranging Equation (11), we obtain:

$$\alpha = \left(1 - \frac{P_c - P_e}{D}\right) \frac{D}{P} \qquad (12)$$

In Vietnamese stock market, a seller pays brokerage fee from 0.15% to 0.35%, a flat tax rate of 0.1% (if any) and other fees for legal service, consutlting service, portfolio management service, etc. Therefore, the minimum value of a round-trip transaction cost α is from 0.3% and the maximum value is equal to 0.9% plus other fees. If the value of α calculated with Equation (12) is consistent with this range, it is also evidence of dividend capture.

Ex-dividend Trading Volume Behaviour

Lakonishok and Vermaelen (1986) posit that examining the reaction of stock price around ex-dividend days is not applicable to recognise whether ex-dividend day behaviour of stock price is explained by long-term or short-term trading theories. Therefore, they propose using trading volume as a new evidence to point out marginal investors affecting stock prices on ex-dividend days. If excessive trading volume is found around ex-dividend days, the stock market is dominated by short-term traders. However, if abnormal trading volume is found positive before and on ex-days but negative after ex-days, long-term traders are marginal investors (Green, 1980). In line with prior studies, this study uses the methodology of event study to calculate abnormal trading volume (AV) around ex-days mean-adjusted model (Kato, Kato, Loewenstein, & Loewenstein, 1995; Lakonishok & Vermaelen, 1986). Event window is 21 days from Day –10 to Day +10 and estimation window contains 30 observations from Day –40 to Day –11. Trading volume (%) is proxied by daily share turnover measured by total trading volume each day divided by number of shares outstanding.

The Relationship between Dividend Yield and Abnormal Return

Prior studies show that relationship between dividend yield and abnormal return is also evidence to clarify whether ex-dividend stock price anomaly is present and which group of investors dominates the market on ex-dividend days (Al-Yahyaee, 2007; Kato et al., 1995; Michaely & Vila, 1996; Naranjo et al., 2000).

Where long-term investors are marginal traders on the ex-day, rearranging Equation (1) we calculate the ex-day return (R_e) by the following equation:

$$R_e = \frac{P_e - P_c + D}{P_c} = \frac{D}{P_c}\left(\frac{t_d - t_g}{1 - t_g}\right)$$

(13)

Return and abnormal return have the same relationship with dividend yield. Hence, Equation (13) implies that the relationship between dividend yield and abnormal return relies on the difference between the tax rate on dividends (t_d) and the tax rate on capital gains (t_g) with three possible cases. Firstly, if there is no

different taxation between dividends and capital gains, the abnormal return is zero. Secondly, if the difference is positive, dividend yield is positively correlated to abnormal return. Thirdly, if the difference is negative, dividend yield is negatively related to abnormal return.

However, determination of the relationship between dividend yield and abnormal return is more complicated if marginal traders are short-term traders. In Vietnamese stock market, t_0 is equal to zero, rearranging Equation (3) we get:

$$R_e = \frac{P_e - P_c + D}{P_c} \leq \frac{\alpha P}{P_c} \equiv R_c \tag{14}$$

Where R_c is the maximum ex-day return in line with equilibrium when dividend capture investors are present.

When dividend capture investors determine the ex-day return, $P_e = (1 + R_c)P_c - D$. In line with Karpoff and Walkling (1990), substituting for P_e in Equation (14) and differentiating R_c with respect to dividend yield (D/P_c) we obtain:

$$\frac{\partial R_c}{\partial (D/P_c)} = -\frac{2\alpha}{1 - 2\alpha} \tag{15}$$

Equation (15) indicates three cases for the relationship between dividend yield and abnormal return on the ex-day. Firstly, if $\alpha < 1/2$, there is a negative relationship between dividend yield and the value of R_c. Consequently, stocks with higher dividend yields have higher abnormal returns. Secondly, if $\alpha > 1/2$, dividend yield is positively related to the value of R_c. This leads to a negative relationship between dividend yield and abnormal return. Thirdly, if $\alpha = 1/2$, dividend yield and abnormal return have no association. However, according to Vietnamese institutional environment, the transaction costs include brokerage fees for successful stock varing from 0.15% to 0.35% of transaction value and flat tax rate of selling price (if any). Hence, α is less than 50%. This indicates that if dividend capture investors are marginal traders on the ex-day, dividend yield is negatively related to abnormal return on the ex-day.

In consistence with Al-Yahyaee (2007), Dasilas and Leventis (2011), Kato et al. (1995), Michaely and Vila (1996), and Naranjo et al. (2000), we develop a regression model to investigate the relationship between dividend yield and abnormal return while controlling for the effects of stock liquidity, abnormal trading volume, firm size and dividend payment frequency. The regression model is presented as follows:

$$AR_0 = \beta_0 + \beta_1 DY + \beta_2 AVV + \beta_3 AV_0 + \beta_4 SIZ + \beta_5 YEA + \beta_6 SEM \tag{16}$$

Where: AR_0 is the abnormal return on the ex-day. DY is dividend yield. AVV is average trading volume calculated from the estimation window of 30 observations from Day –40 to Day –11. AV_0 is the abnormal trading volume on the ex-day. SIZ is firm size measured by natural logarithm of market capitalisation. YEA is a dummy variable assigned 1 if the dividend is paid annually and 0 otherwise. SEM is a dummy variable assigned 1 if the dividend is paid semi-annually and 0 otherwise.

RESEARCH DATA

Sample Selection

Database for this study is provided by Tan Viet Securities Company (www.tvsi. com.vn) and cross-checked with Stockbiz's (www.stockbiz.vn). The sample period is from 1 January 2006 to 31 December 2011. To avoid bias in the research findings, observations are eliminated from the research sample if they meet the following criteria:

1. Observations experiencing events, namely stock splits, stock dividends, share repurchases and right issues within 21 days from Day –10 to Day +10;

2. Observations with missing or incomplete information including price data, trading volume data and dividends;

3. Observations without transactions for more than 10 days in the estimation period.

After the above elimination, the research sample contains 781 observations. Following Milonas et al. (2006), we remove 3% of outliers including 1.5% of highest and 1.5% of lowest values of raw day price drop ratio (PDR$_1$). As a result, the final research sample includes 757 observations from 277 firms.

Descriptive Statistics

Table 4 presents the descriptive statistics of dividend, dividend yield, price drop and four price drop ratios for the full sample of 757 observations (Panel A), the first sub-sample of 332 observations over the period from 2006 to 2009 (Panel B) and the second sub-sample of 425 observations during the period from 2010 to 2011 (Panel C). Panel A shows that the mean and the median of dividend are 1.056 and 1.000 while the corresponding measures of price drop on the ex-dividend day are lower at 0.755 and 0.600, respectively. In addition, the mean (median) of

price drop to dividend ratios raw and adjusted by daily market return (i.e. PDR_1 and $APDR_1$) which are 0.659 (0.667) and 0.635 (0.749), respectively, also implies that price drop is smaller than dividend on the ex-day. The average value of price drop to dividend ratio in Vietnamese stock market is lower than that in the U.S. market which is 0.788 (Jakob & Ma, 2007) and higher than that in Hong Kong stock market which is 0.432 (Frank & Jagannathan, 1998). Moreover, the location measures of unadjusted ex-dividend day price drop to the last cum-day stock price ratio (PDR_2) and market-adjusted ex-dividend day price drop to the last cum-day stock price ratio ($APDR_2$) are smaller than those of dividend yield. This is consistent with the findings in Hong Kong stock market although average ex-dividend day price drop to the last cum-day stock price ratio and dividend yield in Vietnamese stock market are higher (Frank & Jagannathan, 1998).

Table 4
Descriptive statistics of dividend, dividend yield, price drop and price drop ratio

	DIV	DY	P_c-P_e	PDR_1	$APDR_1$	PDR_2	$APDR_2$
Panel A: Full sample, N = 757							
Mean	1.056	0.043	0.755	0.659	0.635	0.034	0.034
Median	1.000	0.036	0.600	0.667	0.749	0.028	0.027
St. deviation	0.566	0.029	1.288	1.204	1.051	0.043	0.040
1st-quartile	0.700	0.021	0.000	0.000	0.228	0.000	0.006
3rd-quartile	1.200	0.057	1.300	1.200	1.113	0.059	0.053
Panel B: Sub-sample 2006−2009, N = 332							
Mean	0.991	0.032	0.702	0.683	0.649	0.025	0.025
Median	0.900	0.024	0.600	0.667	0.810	0.021	0.021
St. deviation	0.535	0.022	1.585	1.505	1.260	0.039	0.033
1st-quartile	0.600	0.016	−0.100	−0.134	0.166	−0.005	0.004
3rd-quartile	1.200	0.042	1.500	1.500	1.204	0.050	0.041
Panel C: Sub-sample 2010−2011, N = 425							
Mean	1.107	0.052	0.796	0.641	0.624	0.041	0.040
Median	1.000	0.047	0.600	0.667	0.723	0.033	0.034
St. deviation	0.584	0.031	0.997	0.903	0.854	0.044	0.043
1st-quartile	0.700	0.029	0.200	0.250	0.263	0.009	0.010
3rd-quartile	1.347	0.066	1.200	1.083	1.075	0.066	0.061

Notes: DIV is dividend per share in 1000 VND. DY is dividend yield calculated by dividend per share divided by cum-day price. $P_c - P_e$ is the difference between cum-day price (P_c) and ex-day price (P_e). PDR_1 is unadjusted price drop to dividend ratio. $APDR_1$ is market-adjusted price drop to dividend ratio. PDR_2 is unadjusted price drop to cum-day price ratio. $APDR_2$ is market-adjusted price drop to cum-day price ratio.

Panel B and Panel C also illustrates that price drop is less than dividend in the two sub-samples. The price drop to dividend ratios namely PDR_1 and $APDR_1$ are lower but the price drop to cum-day price ratios including PDR_2 and $APDR_2$ are higher in the period from 2010 to 2011. One explanation is that stock prices are much lower in the period from 2010 to 2011 as shown in Figure 1.

EMPIRICAL FINDINGS

Ex-dividend Stock Price Behaviour

Table 5 shows the reaction of stock price on the ex-dividend day by comparing theoretical and observed values of mean and median for four variables including PDR_1, $APDR_1$, PDR_2 and $APDR_2$. Theoretical values of price drop to dividend ratios (i.e. PDR_1 and $APDR_1$) are one and those of price drop to cum-day price ratios (i.e. PDR_2 and $APDR_2$) are corresponding dividend yields. The differences between mean values of theoretical and observed values are tested by *t*-test whilst the differences between median values are tested by the non-parametric Wilcoxon signed rank test.[1] It is clear that the observed values of mean PDR_1, $APDR_1$, PDR_2 and $APDR_2$ are less than their theoretical values at the significant level of 1% in the full sample and two sub-samples. In addition, the non-parametric test also illustrates that there are significant differences between the theoretical mean values of price drop ratios and that their observed median values at 1%. The high consistence in the results of *t*-test and Wilcoxon signed rank test indicates that contrary to Miller and Modigliani's perfect market argument supporting the indifference between dividend payment and price drop on the ex-day, in this case investors are not indifferent between dividends and capital gains.

However, Table 3 shows that most of the expected price drop to dividend ratios under the impact of tax policy from 2006 to 2011 are equal to or greater that one. Only when individual investors who pay 0.1% of selling price without registering to pay 20% of capital gains are marginal traders from January 2010 to July 2011, the expected price drop to dividend ratio is equal to 95% whilst the mean price drop to dividend ratios (i.e. PDR_1 and $APDR_1$) varies from 60% to 70% in the full sample and two sub-samples. Therefore, we find that the tax treatment of dividends and capital gains is unable to explain the ex-dividend day stock price behaviour in Vietnamese stock market. In this case, only the dividend capture hypothesis is possible for explanation of this ex-day stock price anomaly. In addtion, we find that there are only 5.8% of observations with which dividend amounts are rounded down to next ticks. The average price drop to dividend ratio on ex-dividend days of these observations decreases only 0.07 under the impact of price adjusment while the mean and median values of PDR_1 and $APDR_1$ are

lower than 0.75. This implies that the price discreteness hypothesis suggested by Bali and Hite (1998) also fails to explain this anomaly significantly. Thus, we continue to investigate effects of dividend capture trading on ex-day returns by examining stock price behaviour around ex-dividend days.

Table 5
Ex-dividend day stock price behaviour

	Mean			Median		
	Theoretical value	Observed value	*t*-statistic	Theoretical value	Observed value	*p*-value
Panel A: Full sample, N = 757						
PDR_1	1.000	0.659***	−7.782	1.000	0.667***	0.000
$APDR_1$	1.000	0.635***	−9.553	1.000	0.749***	0.000
PDR_2	0.043	0.034***	−8.811	0.036	0.028***	0.000
$APDR_2$	0.043	0.034***	−11.547	0.036	0.027***	0.000
Panel B: Sub-sample 2006 – 2009, N = 332						
PDR_1	1.000	0.683***	−3.841	1.000	0.667***	0.000
$APDR_1$	1.000	0.649***	−5.078	1.000	0.81***	0.000
PDR_2	0.032	0.025***	−3.913	0.024	0.021***	0.000
$APDR_2$	0.032	0.025***	−5.792	0.024	0.021***	0.000
Panel C: Sub-sample 2010 – 2011, N = 425						
PDR_1	1.000	0.641***	−8.186	1.000	0.667***	0.000
$APDR_1$	1.000	0.624***	−9.068	1.000	0.723***	0.000
PDR_2	0.052	0.041***	−8.582	0.047	0.033***	0.000
$APDR_2$	0.052	0.040***	−10.227	0.047	0.034***	0.000

Notes: PDR_1 is unadjusted price drop to dividend ratio. $APDR_1$ is market-adjusted price drop to dividend ratio. PDR_2 is unadjusted price drop to cum-day price ratio. $APDR_1$ is market-adjusted price drop to cum-day price ratio. *A significant difference from the theoretical value at the 10% level. ** A significant difference from the theoretical value at the 5% level. *** A significant difference from the theoretical value at the 1% level.

Table 6 presents abnormal returns and cumulative abnormal returns around ex-dividend days calculated by both market model and mean adjusted model for the full sample and for two sub-samples. Panel A shows that in the full sample, abnormal returns are significantly positive on many days in the pre ex-day period and significantly negative on Day +1. In the sub-sample from 2006 to 2009, abnormal returns are positive at 1% of significance for both models on Day −5; however, abnormal returns in the post ex-dividend day period are not significantly different from zero despite their negative average values from Day +1 to Day +8. The sub-sample for the period between 2010 and 2011 gives similar

Table 6
Abnormal returns (%) and cumulative abnormal returns (%) around ex-dividend day

Day	Full sample (N = 757)		Sub-sample 2006–2009 (N = 332)		Sub-sample 2010–2011 (N = 425)	
	Market model	Mean adjusted	Market model	Mean adjusted	Market model	Mean adjusted
Panel A: Abnormal return (%)						
−10	−0.002	−0.005	0.010	0.062	−0.012	−0.057
−9	0.170**	0.215**	0.143	0.157	0.190*	0.261**
−8	0.176*	0.115	0.117	0.057	0.222*	0.161
−7	0.255***	0.243**	0.198	0.166	0.300***	0.303**
−6	0.251***	0.269***	0.212	0.304*	0.283**	0.242**
−5	0.393***	0.512***	0.491***	0.678***	0.317***	0.382***
−4	0.299***	0.220**	0.287**	0.192	0.308***	0.242**
−3	0.144	0.163	0.127	0.251	0.157	0.095
−2	0.182**	0.093	0.014	−0.027	0.313***	0.187
−1	0.014	0.018	−0.128	−0.029	0.125	0.054
0	0.934***	0.900***	0.520***	0.556***	1.257***	1.168***
1	−0.176**	−0.203*	−0.101	−0.085	−0.234**	−0.295**
2	−0.058	0.032	−0.108	0.038	−0.019	0.028
3	−0.134	−0.205*	−0.012	−0.041	−0.229**	−0.334***
4	−0.109	−0.115	−0.093	−0.092	−0.121	−0.132
5	−0.053	−0.096	−0.058	−0.060	−0.048	−0.125
6	−0.022	0.067	0.041	0.190	−0.072	−0.028
7	−0.037	−0.036	−0.109	−0.062	0.020	−0.016
8	0.037	0.007	−0.159	−0.207	0.191	0.174
9	0.009	−0.028	0.134	0.187	−0.089	−0.196
10	0.010	0.041	0.007	0.112	0.012	−0.015
Panel B: Cumulative abnormal return (%)						
CAR (−10 −1)	1.882***	1.844***	1.473***	1.812**	2.020***	1.868***
CAR (−4 −1)	0.639***	0.494**	0.301	0.388	0.090***	0.578**
CAR (−2 −1)	0.196	0.111	−0.113	−0.055	0.044***	0.241
CAR (+1 +2)	−0.234*	−0.171	−0.209	−0.048	−0.025	−0.267
CAR (+1 +4)	−0.477**	−0.491**	−0.315	−0.181	−0.060**	−0.733***
CAR (+1 +10)	−0.532*	−0.536	−0.460	−0.021	−0.059	−0.939**

Note: CAV is cumulative abnormal returns. *A significant difference from zero at the 10% level. **A significant difference from zero at the 5% level. ***A significant difference from zero at the 1% level.

results as shown in the full sample. Overall, these findings indicate that abnormal returns are positive before the ex-day and negative after the ex-day. Moreover, Panel A also illustrates that abnormal returns on the ex-day are highest in the event period and statistically significant at 1% for two measurement techniques in the full samples and both sub-samples. These results are in line with the findings presented in Table 5, which show that price drop is much lower than dividend payment on the ex-dividend day.

In line with the findings presented in Panel A, Panel B shows that cumulative abnormal returns in the pre ex-day period namely CAR (−10 −1) and CAR (−4 −1) are statistically different from zero with the significant levels from 1% to 5% for the entire sample and for two sub-samples in both models. Cumulative abnormal returns are negative but not different from zero in the first sub-sample whilst cumulative abnormal return from Day +1 to Day +4 for both market model and mean-adjusted model is significantly negative in the second sub-sample.

Table 7
Estimated mean and median of round-trip transaction cost α (%)

Full sample (N = 757)				Sub-sample 2006−2009 (N = 332)				Sub-sample 2010−2011 (N = 425)			
Unadjusted P_e		Adjusted P_e		Unadjusted P_e		Adjusted P_e		Unadjusted P_e		Adjusted P_e	
Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
0.88	1.24	0.97	0.95	1.09	1.41	1.20	1.30	0.61	0.91	0.68	0.57

However, positive abnormal returns in the pre ex-day period and negative abnormal returns in the post ex-day period are not sufficient to conclude that the ex-day behaviour of stock price is consistent with dividend capture trading since stock abnormal returns are also determined by market liquidity. If market liquidity causes abnormal buying pressure before the ex-day, abnormal returns are positive and if it causes abnormal selling pressure after the ex-day, abnormal returns become negative. Therefore, we continue to investigate the applicability of dividend capture trading with trading volume behaviour around the ex-day.

Moreover, in accordance with Equation (12), we calculate the mean and the median value of round-trip transaction cost α with unadjusted and adjusted stock price on the ex-dividend day. Table 7 shows that both the mean and the median value are from about 0.6% to 1.4%. This range is consistent with transaction costs which sellers are likely to pay in Vietnamese stock market. Furthermore, transaction costs are lower from 2010 to 2011. This can be explained that the stock market is more developed and the market of supporting services is more competitive in this period.

Ex-dividend Trading Volume Behaviour

Lakonishok and Vermaelen (1986) assert that trading volume is evidence to identify marginal investors affecting stock prices on ex-dividend days. Significantly positive abnormal trading volume both before and after the ex-dividend day is evidence-supporting dividend captures trading activities and dividend capture traders are marginal investors in the stock market on the ex-day.

Table 8 illustrates abnormal trading volume and cumulative abnormal trading around ex-dividend days. Panel A shows that in the full sample, significantly positive abnormal trading volume is present in the ten trading days before the ex-day and in two particular days after the ex-day (i.e. Day +4 and Day +5). Similarly, in the first sub-sample, there are seven days within pre ex-dividend period and three days in the post ex-dividend period experiencing significantly positive abnormal trading volume. In the second sub-sample, the evidence of abnormal trading volume in the period prior to the ex-day is consistent with buying pressure; however, the evidence abnormal trading volume of selling pressure in the post ex-day period appears mixed.

One of explanations for the differences in ex-dividend trading volume behaviour and stock price behaviour in the two sub-samples is market liquidity which is measured by average trading volume calculated from the estimation window of 30 observations from Day –40 to Day –11. Table 8 shows that the mean of average trading volume of over the second period between 2010 and 2011 is lower than in the first period from 2006 to 2009 (0.358% vs. 0.503%) and their difference is statistically significant at 1% with *t*-test. Therefore, short-term investors who buy stocks before the ex-day find it more difficult to sell them after they go ex-dividend in the second period. This leads to insignificantly positive abnormal trading and considerably lower and significantly less than zero abnormal returns after the ex-day (as showed in Table 6).

Panel B, Table 8 presents cumulative abnormal trading volume calculated by mean adjusted model around ex-dividend days. Consistent with Panel A, cumulative abnormal trading volume before the ex-dividend day is positive at the significant level of 1% and CAV (–1 +1) is also significantly different from zero in both the full sample and two sub-samples. For the post ex-day period, CAV (+1 +6) is positive at the significant level of 10% in the full sample and CAV (+1 +2) and CAV (+1 +6) are positive at the significant levels of 1% and 10%, respectively in the first sub-sample. These results support the hypothesis of short-term trading activities around the ex-dividend day.

Table 8

Abnormal trading volume and cumulative abnormal trading volume around ex-dividend days

Day	Full sample (N = 757)	Sub-sample 2006 – 2009 (N = 332)	Sub-ample 2010 – 2011 (N = 425)
Panel A: Abnormal trading volume (%)			
−10	0.082***	0.107**	0.063*
−9	0.043**	0.037	0.047*
−8	0.054**	0.051	0.056*
−7	0.060**	0.105**	0.025
−6	0.090**	0.113	0.072**
−5	0.098***	0.072*	0.118***
−4	0.092***	0.115***	0.075**
−3	0.098***	0.139***	0.066**
−2	0.112***	0.123**	0.103**
−1	0.140***	0.140***	0.141***
0	0.052**	0.035	0.066**
1	0.023	0.040	0.010
2	0.027	0.009	0.040
3	0.021	0.014	0.028
4	0.070*	0.107**	0.042
5	0.059**	0.072*	0.049
6	0.042	0.083	0.010
7	0.033	0.039	0.029
8	−0.011	0.025	0.000
9	0.027	0.033	0.022
10	0.047	0.097*	0.008
Panel B: Cumulative abnormal trading volume (%)			
CAV (−10 −1)	0.868***	1.000***	0.766***
CAV (−6 −1)	0.630***	0.701***	0.574***
CAV (−2 −1)	0.252***	0.262***	0.243***
CAV (−1 +1)	0.215***	0.214**	0.216**
CAV (+1 +2)	0.049	0.049***	0.050
CAV (+1 +6)	0.242*	0.324*	0.178
CAV (+1 +10)	0.338	0.467	0.237

Notes: Abnormal trading volume is measured by mean adjusted model with the estimation window of 30 observations from Day −40 to Day −11. CAV is cumulative abnormal trading volume. *A significant difference from zero at the 10% level. **A significant difference from zero at the 5% level. ***A significant difference from zero at the 1% level.

The relationship between dividend yield and abnormal return

Table 9 shows summary statistics of variables in the regression model for full sample and both sub-samples. Panel A illustrates that mean and median ex-day abnormal returns (AR_0) of the full sample are 0.934% and 0.999%, respectively and the standard deviation is extremely large, at 2.485%. This implies that the distribution of ex-day abnormal return witnesses an approximate symmetry but large variability. The average values of dividend yield (DY), average trading

Table 9
Descriptive statistics for regression analysis

Variables	Median	Mean	Standard deviation	1st quartile	3rd quartile
Panel A: Full sample, N = 757					
AR0 (%)	0.999	0.934	2.485	−0.515	2.618
DY (%)	3.650	4.336	2.943	2.110	5.686
AVV (%)	0.219	0.422	0.591	0.094	0.521
AV0 (%)	−0.024	0.052	0.651	−0.141	0.113
SIZ	19.742	20.030	1.360	19.067	20.733
YEA	1.000	0.597	0.491	0.000	1.000
SEM	0.000	0.316	0.465	0.000	1.000
Panel B: Sub-sample 2006−2009, N = 332					
AR0 (%)	0.511	0.520	2.298	−0.955	1.982
DY (%)	2.390	3.194	2.182	1.626	4.167
AVV (%)	0.269	0.503	0.675	0.142	0.570
AV0 (%)	−0.026	0.035	0.643	−0.174	0.159
SIZ	19.741	20.007	1.394	19.007	20.722
YEA	1.000	0.539	0.499	0.000	1.000
SEM	0.000	0.328	0.470	0.000	1.000
Panel C: Sub-sample 2010−2011, N = 425					
AR0 (%)	1.402	1.257	2.579	−0.248	2.955
DY (%)	4.651	5.229	3.148	2.950	6.604
AVV (%)	0.171	0.358	0.508	0.066	0.433
AV0 (%)	−0.022	0.066	0.657	−0.116	0.073
SIZ	19.751	20.048	1.335	19.120	20.742
YEA	1.000	0.642	0.480	0.000	1.000
SEM	0.000	0.306	0.461	0.000	1.000

Notes: AR_0 is the abnormal return on the ex-day. DY is dividend yield. AVV is average trading volume calculated from the estimation window of 30 observations from Day −40 to Day −11. AV_0 is the abnormal trading volume on the ex-day. SIZ is firm size measured by natural logarithm of market capitalisation. YEA is a dummy variable assigned 1 if dividends are paid annually. SEM is a dummy variable assigned 1 if the dividends are paid semi-annually.

volume (AVV) and ex-day abnormal trading volume (AV_0) are 0.043, 0.422% and 0.052%, respectively and their distribution is highly skewed and of considerable variability. Firm size's distribution has moderate skewness due to small difference between its mean and median (i.e. 20.030 and 19.742) and remarkably small standard deviation. Moreover, descriptive statistics illustrate that the first period constitutes 43.9% observations of the full sample. Like in the U.S and Japan, number of dividend payment per year in Vietnam is not limited. Table 9 illustrates that there are 59.7% and 31.6% of observations paying dividends annually and semi-annually, respectively and 8.7% paying dividends more than two times per year. The percentage of observations with semi-annually basis in Vietnam is approximately half of that in Japan at 69% (Kato et al., 1995).

Panel B and Panel C show that average abnormal return and abnormal trading volume on the ex-day in the period from 2006 to 2009 are about half of those in the period from 2010 to 2011. This is consistent with Dasilas and Leventis (2011) positing that when the ex-day return is impacted by dividend capture traders, short-term trading exists on and around the ex-day and abnormal trading volume tends to be positively related to abnormal return on the ex-day. Moreover, the means values of average trading volume (AVV) and dividend yield (DY) in the first period (i.e. 0.503% and 3.194%) are respectively higher and lower than corresponding measures in the second period (i.e. 0.358% and 5.229%).

Table 10
Regression results

Explanatory variables	Full sample		Sub-sample 2006 – 2009		Sub-sample 2010 – 2011	
	Coefficients	*t*-statistics	Coefficients	*t*-statistics	Coefficients	*t*-statistics
Intercept	2.332	1.550	0.158	0.080	6.999***	3.170
DY	−8.143**	−2.440	−12.538**	−1.990	−16.189***	−3.710
AVV	−0.194	−1.260	0.011	0.060	−0.309	−1.240
AV0	0.266*	1.920	0.400**	2.020	0.143	0.750
SIZ	−0.082	−1.150	0.016	0.170	−0.265***	−2.600
YEA	0.674**	2.040	0.469	1.210	0.520	0.910
SEM	0.800**	2.320	0.500	1.210	0.634	1.080
Adj. R-squared	0.013		0.015		0.028	
F-statistics	2.68**		1.86*		3.07***	
Number of observations	757		332		425	

Notes: The dependent variable is abnormal return on the ex-day (AR_0) measured by market model. DY is dividend yield. AVV is average trading volume calculated from the estimation window of 30 observations from Day −40 to Day −11. AV_0 is the abnormal trading volume on the ex-day. SIZ is firm size measured by natural logarithm of market capitalization. YEA is a dummy variable assigned 1 if dividends are paid annually. SEM is a dummy variable assigned 1 if the dividends are paid semi-annually. *Significant at the 10% level. **Significant at the 5% level. ***Significant at the 1% level.

Table 10 presents OLS regression results for the entire sample and for two sub-samples. The dependent variable is ex-day abnormal return calculated by the market model. Dividend yield is negatively related to ex-day abnormal return at the significant level from 1% to 5% in the findings for the full sample and both sub-samples. These findings are contrary to the expected positive relationship between dividend yield and abnormal return on the ex-dividend day under the impact of taxation. In line with ex-dividend price and trading volume behaviour, the significantly negative relationship between dividend yield and abnormal return implies that dividend capture investors are marginal traders on the ex-day and the round-trip transaction cost α is smaller than 1/2 which is consistent with institutional environment of Vietnamese stock market and Table 7. In addition, in line with Dasilas and Leventis (2011); Lakonishok and Vermaelen (1986), the

Table 11

Abnormal returns and abnormal trading volume around ex-dividend days by dividend yield

Day	Abnormal returns (%)				Abnormal trading volume (%)			
	1st quartile	2nd quartile	3rd quartile	4th quartile	1st quartile	2nd quartile	3rd quartile	4th quartile
−10	−0.297*	0.031	0.089	0.159	−0.119	−0.026	0.046	0.083
−9	−0.112	0.099	0.114	0.495**	−0.090	0.321	0.204	0.432**
−8	−0.084	0.026	0.291*	0.416**	−0.271	0.017	0.285	0.436*
−7	0.030	0.006	−0.010	0.890***	0.053	−0.034	0.130	0.829***
−6	0.034	0.168	0.277	0.364*	0.256	−0.077	0.467**	0.418**
−5	0.175	0.333*	0.108	0.941***	0.222	0.754***	0.189	0.871***
−4	−0.125	0.142	0.427**	0.661***	−0.252	0.123	0.389*	0.610***
−3	−0.082	0.376**	0.251	0.065	−0.055	0.455**	0.233	0.009
−2	0.095	0.059	0.323*	0.272	−0.005	0.070	0.261	0.033
−1	−0.087	−0.069	0.107	0.023	−0.022	−0.124	0.271	−0.065
0	0.761***	1.150***	1.376***	0.636***	0.670***	1.101***	1.325***	0.512**
1	0.149	−0.218	−0.274	−0.400**	0.169	−0.388*	−0.107	−0.476**
2	0.116	−0.007	−0.109	−0.188	0.275	0.025	0.095	−0.256
3	−0.055	−0.064	−0.091	−0.402**	−0.071	−0.244	−0.251	−0.275
4	−0.271	0.281*	−0.193	−0.149	−0.389*	0.192	0.019	−0.300
5	−0.239	0.022	0.032	0.043	−0.392*	−0.042	0.129	−0.099
6	−0.163	−0.022	−0.005	0.017	−0.018	−0.013	0.248	0.037
7	−0.256	0.241	−0.244	0.042	−0.363*	0.172	−0.136	0.163
8	−0.343**	0.101	0.169	0.121	−0.666***	0.175	0.223	0.279
9	−0.057	−0.038	0.129	−0.022	−0.285	−0.116	0.210	0.060
10	0.126	−0.046	0.066	−0.113	−0.014	0.076	0.241	−0.160

Note: Abnormal return is measured by market model. Abnormal trading volume is measured by mean adjusted model. *A significant difference from zero at the 10% level. **A significant difference from zero at the 5% level. ***A significant difference from zero at the 1% level.

ex-day abnormal trading volume is significantly associated with ex-day abnormal returns on the ex-dividend day at 10% and 5% in the results for the full sample and the first sub-sample respectively.

Moreover, the dividend capture theory also posits that short-term trading is more prevalent with high-yield stocks. We divide the full sample by quartiles of dividend yield and investigate abnormal returns and abnormal trading volume around ex-dividend days for each quartile. Table 11 indicates that abnormal returns before and after the ex-day are more prevalent in the 4th quartile. Abnormal trading volume in the pre ex-day period is also more prevalent in the 4th quartile.

CONCLUSION

This study investigates both abnormal returns and abnormal trading volume around the ex-dividend day in Vietnamese stock market that appears a promising laboratory due to its trading regulation and taxation based on the full sample of 757 observations. With the event study methodology, we are able to determine whether short-term traders are marginal investors in the ex-day. The findings show that although abnormal trading volume is not significant after stocks go ex-dividend, abnormal returns are significantly positive and negative in the pre and the post ex-dividend day period. Furthermore, the estimated value of mean and median of round-trip transaction cost α and the negative relationship between dividend yield and the ex-day abnormal return in OLS regression analysis are consistent with the institutional environment of the round trip transaction cost under Vietnamese institutional environment. Dividing the full sample by quartiles of dividend yield, we also find that abnormal returns before and after the ex-day are more prevalent in the last quartile. These results are supporting evidence for dividend capture theory.

NOTES

1. Using both parametric and non-parametric tests can avoid the problems of heteroscedasticity and lack of independence pointed out by Eades et al. (1984).

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