

STOCK PRICE BEHAVIOUR AROUND EX-DIVIDEND DATE: A MALAYSIAN CASE

Wan Leng Whatt*

ABSTRACT

This paper examines the stock price behaviour around ex-dividend days. The Malaysia stock data offers an opportunity to illuminate the dividend and tax question since Malaysia practises tax imputation system as opposed to the double taxation system practised by other countries.

Evidence suggests that stock prices decline by about 71.5% of the full amount of dividend on ex-dividend days. This result implies that the marginal tax bracket of the Malaysian investors is about 28.5%.

The second evidence indicates that clientele effect exists in Malaysia, a situation which is similar to Singapore. Empirical results suggest that the clientele effect is direct instead of inverse as reported in the U.S.

The last evidence shows that stock prices do not adjust fully to the stock dividend when they go ex-dividend. In fact, results point out that stock dividend creates value meaning that an arbitrageur can expect to make profit when stock goes ex-dividend.

* Mr. Wan Leng Whatt is the Custom Superintendent at the Royal Custom & Excise Dept.

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1. INTRODUCTION

Ex-dividend day behaviour of stock price has been analysed in numerous studies, most of which have tried to explain the taxation effect on the market valuation of dividend. It is argued that if dividends are tax-penalised, investors should demand a higher before-tax premium from dividend income than from capital gain. They can receive this premium if the drop in stock price on the ex-dividend day is less than the full amount of dividend. Campbell and Beranek (1955) in the United States (US), Elton and Gruber (1970) in the US, Lakonishok and Vermaelen (1983) in Canada, Vanthienen and Vermaelen (1987) in Belgium, Hietala (1990) in Finland and Ariff (1990) in Singapore have provided evidence that the stock price declines by less than the full amount of dividend on ex-dividend days.

To the best of my knowledge, this is the first study on ex-dividend day behaviour in Malaysia. So far, there has been only one study done by Ariff (1990) in Singapore. He documented that the stock price declines by about 87 percent of the dividend amount. Although the price decline was significantly different from the amount of dividend, he concluded that the price decline was weak. Investigation on clientele effect revealed that the relationship between dividend yield and investor's implied tax bracket is direct instead of being inverse as reported in the US. Ariff (1990) explained that high dividend paying stocks would provide the most tax credit to offset the investor's high tax bracket. It is unlikely that the low tax bracket clientele would need too much tax credit to offset their tax.

Like Singapore, Malaysia practises the tax imputation system as opposed to the double taxation regimes practised by other developed countries. Hence, it would be interesting to investigate whether or not the observation made in Malaysia is consistent with that observed by other capital markets, particularly Singapore.

The purpose of this study is to examine stock price behaviour around ex-dividend date. Specifically, it is intended to investigate whether:

- i the stock price decline is systematically less than the cash dividend
- ii there is tax-induced clientele effect
- iii the stock price fully adjusts to its stock dividend on ex-dividend day

2. THEORETICAL FRAMEWORK

2.1. Tax-Induced Clientele Model

The model used to explain the price decline effect on ex-dividend days is the tax-induced clientele model¹ proposed by Elton and Gruber (1970). An individual who has already decided to sell a stock around its ex-date faces a timing decision of whether to sell on cum or ex-day. If he sells cum, then he receives the cum dividend price (P_{CD}) and pays tax at the capital gain tax rate (t_g) on the excess of the cum dividend price over the adjusted cost base of the stock (P_s). If he sells ex, he receives a dividend (D) and ex-dividend price (P_{XD}), pays tax on the dividend at the marginal personal income tax rate on dividend income (t_p) and pays tax on the excess of ex-dividend price over the adjusted cost base of the stock at the capital gain tax rate. For an investor to be indifferent to the timing, we must have

$$P_{CD} - t_g(P_{CD} - P_s) = D(1 - t_p) + P_{XD} - t_g(P_{XD} - P_s) \quad (1)$$

Rearranging,

$$\frac{(P_{CD} - P_{XD})}{D} = \frac{(1 - t_p)}{(1 - t_g)} \quad (2)$$

If there is no tax consideration,

$$\frac{(P_{CD} - P_{XD})}{D} = 1 \quad (3)$$

which simply means that the price decline equals dividend amount. Elton and Gruber (1970) argued that for the market to be in equilibrium, then the ratio of price decline to

dividend, $\frac{(P_{CD} - P_{XD})}{D}$, must reflect the marginal stockholder's tax rates.

If there is no capital gain tax as in Malaysia, then equation (2) becomes,

$$\frac{(P_{CD} - P_{XD})}{D} = 1 - t_p \quad (4)$$

¹Elton (1962) proposed another hypothesis known as short term trading hypothesis to explain the price decline effect. It is not the intention of this paper to investigate the validity of such hypothesis in the Malaysian context since the stock market is not efficient and profitable for short term traders to act.

2.2. Hypotheses

The shareholder's claim of the firm's assets inclusive of the anticipated value of the future cash flows from the firm's investment is reflected by the stock price. A dividend payout is an outflow of value. As such, it is expected that the stock price should decline by the dividend amount (paid out) on ex-dividend day.

In Malaysia, there is no capital gain tax on stocks but dividend is taxed only once at the personal income tax level. Hence, Malaysian declared dividends are also tax-penalised. As such, the tax effect should induce investors to value a dollar of capital gain more than a dollar of dividend. Then, it can be expected that the stock price should decline by less than the full amount of dividend. This deduction yields the first hypothesis.

Hypothesis 1: *The stock price decline of cash dividend paying stocks is less than the full amount of dividend.*

The implication of double taxation regimes is different from a full imputation system. In a double taxation situation, it can be argued that stockholders who are on a higher tax bracket may prefer stocks with low dividend yield. This is because they will have to pay more taxes on dividend income than on capital gain. On the other hand, those stockholders with low tax bracket may prefer high dividend yield because they pay less taxes on dividend income than on capital gain. This is the clientele effect as observed in the US.

Malaysia practises tax imputation system as opposed to the double taxation regime practised by the US. In a tax imputation system, the more dividend one receives, the more the taxpayer is able to reduce his income tax payable on his ordinary income. Therefore, as long as the investor's tax rate is below the corporate tax level, he should look forward to receiving more dividend because of more tax saving. However, a low tax bracket investor enjoys even more tax saving than a high tax bracket investor. Since both low and high tax bracket investors enjoy tax savings, then both investors would prefer high dividend yields. Hence, we can expect that the tax-induced clientele effect is non-existent in Malaysia. This observation leads to the second hypothesis.

Hypothesis 2: *There is no relationship between dividend yield and dividend price ratio.*

These studies have also investigated the price decline effect of stock dividend on ex-dividend days. In Malaysia, unlike cash dividend, there is no tax on stock dividend. Therefore, an investor should value a dollar of stock dividend equal to a dollar of capital gain. Then, it can be expected that ex-stock dividend price should decline by an amount of stock dividend. This expectation gives rise to the third and last hypothesis.

Hypothesis 3: *The stock price of stock dividend paying stocks is equal to the expected stock price after stock dividend adjustment.*

2. DATA AND METHODOLOGY

The sample covers all companies listed on the Kuala Lumpur Stock Exchange which pay out cash and stock dividends for the period 1983 to 1991. The information on ex-dividend date and dividend amount was collected from the Investors Digest. Daily stock prices were sourced from University of Malaya's stock price data base.

The following selection criteria were applied to the original data set :-

- i. Observations with no trading either on ex-dividend day or a day before the ex-dividend day were dropped. (691 observations were eliminated.)
- ii. Observations with price increase on ex-dividend days were dropped. (545 observations were eliminated.)
- iii. Observations with dividend less than bid-ask spread were dropped. (170 observations were eliminated.)
- iv. Observations with dividend payments other than Malaysian currency were dropped. (23 observations were eliminated.)
- v. Observations with special dividends were dropped. (65 observations were eliminated.)
- vi. Observations where the ex-date of dividend coincided with the ex-date of bonus, rights and split issues were dropped. (20 observations were eliminated.)

By applying the above criteria, 998 observations were obtained for the final sample.

The price decline is calculated by using the following equation.

$$PD = P_{CD} - P_{XDA} \quad (5)$$

where,

PD = Price decline

P_{CD} = Stock price on a day before ex-dividend day

P_{XDA} = Adjusted stock price on ex-dividend day

To cater for a rising or falling market, the ex-dividend stock price is corrected for market bias. The adjusted stock price now takes the form of

$$P_{XDA} = P_{XD} \times \frac{CI_{CD}}{CI_{XD}} \quad (6)$$

where,

P_{XD} = Stock price on ex-dividend day

CI_{CD} = Composite Index on a day before ex-dividend day

CI_{XD} = Composite Index on ex-dividend day.

A comparison between price decline and dividend declared is then made.

To measure the clientele behaviour effect, the dividend yield of each individual stock will be analyzed by grouping them into five dividend yield quintiles. Twenty percent of the lowest dividend yield stocks comprises the first quintile, the next twenty percent forms the second quintile and so on until the last twenty percent forms the fifth quintile. The clientele effect is then examined by studying the relationship between average ex-dividend price ratio and average dividend yield.

For the stock dividend data, there is a total of 142 observations. Out of these observations, 50 observations were excluded because there was no trading done either on ex-stock dividend day or on a day before it went ex-stock dividend. Another 7 observations were dropped because the companies were under temporary suspension. This leads to a final sample of 85 observations.

Two considerations were made in studying the stock dividend. One situation is where the stock dividend is declared in isolation. The other situation is where stock dividend is declared jointly with a rights issue. The ex-date stock price is compared with the expected adjusted price. The adjusted price has been earlier corrected for market bias.

EMPIRICAL RESULTS

4.2. Price Decline (Cash Dividend)

On the average, the amount of dividends paid out is 7.94 sen per share while the stock prices decline by an amount of 5.68 sen per share. This finding, in general, gives a price drop of 0.7154 (71.54 percent) relative to dividend. The statistical test for the differences between dividend and price decline yields a t-value of -6.82 which is significant at 0.0001 level. Applying the tax-induced clientele model as given in equation (4), the implied marginal tax bracket of the investor holding the Malaysian-listed stocks is about 44.11 percent.

While the issue is on tax rates, it is appropriate to observe the changes in the implied tax brackets corresponding with the revised personal income tax rates for resident individuals. Table 1 shows such changes. In line with the lowering of the revised personal tax rates, the implied tax bracket of the investors also displays a decreasing trend. This evidence shows that investors adjust stock prices accordingly with the decreasing personal income tax rates.

TABLE 1
IMPLIED TAX BRACKETS RELATIVE TO CHANGES IN
PERSONAL INCOME TAX RATES

	Personal Tax at 55%	Personal Tax at 40%	Personal Tax at 35%
Year Assessment	1983 to 1984	1985 to 1990	1991 and onwards
Number of Observations	194	630	174
Price Decline / Share (\$)	0.0531	0.0554	0.0658
Dividend / Share (\$)	0.0950	0.0753	0.0772
Price Decline / Dividend	0.5589	0.7357	0.8523
Implied Tax Bracket (%)	44.11	26.43	14.77

Having examined the overall market performance, it is also important to investigate the price decline effect by sectors. Table 2 presents five out of the seven sectors listed. The Hotel and Second Board sectors are excluded because the sample size is too small for the finding to be meaningful.

TABLE 2
FREQUENCY OF PRICE DECLINE RELATIVE TO DIVIDEND BY SECTORS

	Industrial	Finance	Property	Plantations	Tin
Number of Observations	617	74	78	171	46
Price Decline < Dividend	471 (76.4)	50 (67.6)	53 (67.9)	134 (78.4)	32 (69.6)
Price Decline = Dividend	3 (0.4)	0 (0.0)	0 (0.0)	1 (0.6)	0 (0.0)
Price Decline > Dividend	143 (23.2)	24 (32.4)	25 (32.1)	36 (21.0)	14 (30.4)
Mean Price Decline / Share	0.0606	0.0501	0.0359	0.0431	0.1067
Mean Dividend / Share	0.0812	0.0631	0.0469	0.0722	0.1676
Mean Price Drop / Share	0.7463	0.7940	0.7655	0.5970	0.6366
T-value	-4.23*	- 1.93@	- 2.97+	-5.44*	-3.55*

* significant at 0.001 level

+ significant at 0.005 level

@ significant at 0.1 level

It is interesting to find that the observed average price decline moves in tandem with the average dividend. In fact, they behave very well for all the sectors investigated. To further illustrate, since tin-related companies declared the highest average dividend, the price decline observed also recorded the highest average stock price drop-off. Similarly, the same pattern applies to property companies where a smaller average price decline is observed for a smaller average dividend. Such a relationship is interesting because there was no reason to expect that small dividends should be accompanied by small price declines. The evidence shows that the investors holding Malaysian listed stocks are efficient in adjusting their stock prices on ex-dividend days.

It is also observed that the average price decline relative to dividend in the tin and plantation sectors is lower than the average price decline relative to dividend in all other sectors. This observation indicates that the implied tax brackets of investors holding tin and plantation sectors are much higher than the overall implied tax bracket (It was reported earlier that the overall implied tax bracket of investors is 28.5 percent). This could be due to the possibility that in the early 1980's, a significant proportion of the plantation and tin-related stocks were owned by foreigners. Since these foreigners are subjected to 40 percent corporate tax before 1989, therefore the implied tax bracket of the investors holding plantation and tin-related stocks can be expected to be higher than 28.5 percent.

Another area that deserves investigation is the examination of the investor's implied tax bracket when they hold trustee and non-trustee stocks. A lot has been said that the institutions which are subjected to high tax rates seem to prefer holding trustee stocks. If this statement is true, then one can observe that the investor's implied tax bracket for trustee stocks is higher than for non-trustee stocks.

Table 3 shows the investor's implied tax bracket when they hold trustee and non-trustee stocks. The implied tax bracket of the investor holding trustee stocks is higher than the non-trustee stock holder. This observation shows that more investors are in the higher tax rates for trustee stocks than for non-trustee stocks. Hence, the evidence supports that institutions prefer holding trustee stocks than non-trustee stocks.

TABLE 3
INVESTOR'S IMPLIED TAX BRACKET HOLDING
TRUSTEE AND NON-TRUSTEE STOCKS

	Trustee Stocks	Non-Trustee Stocks
Number of Observations	846	152
Price Decline / Share (\$)	0.0559	0.0615
Dividend / Share (\$)	0.0796	0.0784
Price Decline / Dividend	0.7022	0.7844
Implied Tax Bracket (%)	29.77	21.56

CLIENTELE EFFECT

4.2. Clientele Effect

Table 4 lists the relationship between dividend yield and ex-dividend day ratio. The results clearly show that there is evidence of tax clientele effect in the Malaysian stock market. This finding lends further support to Ariff's finding that the clientele effect is in fact direct instead of inverse as reported in the US.

TABLE 4
MARKET-ADJUSTED EX-DIVIDEND DAY RATIOS IN DIFFERENT DIVIDEND
YIELD QUINTILES

Quintile	Number Of Firms	Mean Dividend Yield ¹	Mean Price Decline/ Dividend ²	Implied Tax Bracket
1	103	0.01012	1.486	NM
2	121	0.01542	0.898	0.102
3	120	0.02022	0.723	0.277
4	109	0.02746	0.580	0.420
5	103	0.04473	0.464	0.536

The mean dividend yield is calculated by averaging all the dividend yields within the quintile.

The mean price decline relative to dividend is calculated by averaging the quotient of price decline over dividend falling within the quintile.

NM = Not meaningful.

Table 5A lists the amount of tax saving which the investor can look forward to if a particular firm declares a 2%, 4%, 6%, 8% or a 10% dividend. The table shows that an investor in the 30 percent tax bracket is able to save RM1 on a stock paying 2 percent dividend yielding a tax saving ratio of 0.33 percent. The same investor would save RM5 on a stock paying 10 percent dividend yielding a tax saving ratio of 1.67 percent. Hence he should look forward to receiving higher dividend. The tax saving ratio is calculated by dividing the tax saving by the tax due on the ordinary income.

TABLE 5A

THE EFFECT OF DIVIDEND ON A HIGH TAX BRACKET INVESTOR

	Dividend Categories				
	2%	4%	6%	8%	10%
Dividend (\$)	20	40	60	80	100
Dividend Tax (\$)	7	14	21	28	35
Ordinary Income (\$)	1000	1000	1000	1000	1000
Tax Due On Ordinary Income (30%) (\$)	300	300	300	300	300
Gross-up Income (\$)	1020	1040	1060	1080	1100
Tax Due On Gross-up Income (\$)	306	312	318	324	330
Tax Paid (After Offset) (\$)	299	298	297	296	295
Tax Saving (\$)	1	2	3	4	5
Tax Saving Ratio (%)	0.33	0.67	1.00	1.33	1.67

TABLE 5B
TAX SAVING RATIO FOR VARIOUS DIVIDENDS
AND PERSONAL INCOME TAX BRACKETS

		Dividend Categories				
		2%	4%	6%	8%	10%
10% Tax Bracket	(%)	5.00	10.00	15.00	20.00	25.00
20% Tax Bracket	(%)	1.50	3.00	4.50	6.00	7.50
30% Tax Bracket	(%)	0.33	0.67	1.00	1.33	1.67
35% Tax Bracket	(%)	0.00	0.00	0.00	0.00	0.00

Notes:

1. The mechanics of calculating the tax saving ratio is same as those found in Table 5A

Table 5B lists the tax saving ratios of investors with 10, 20, 30, and 35 percent personal tax rates at various dividend categories. The table shows that both high and low tax bracket investors stand to gain more tax saving with higher dividends. Therefore, both investors should prefer high dividend. Hence, it can be expected that tax-induced clientele effect is non-existent in Malaysia. Only an investor with 35 percent tax rate would be indifferent. However, this expectation is in conflict with the observations made in Table 4, which shows that tax-induced clientele effect actually exists.

4.3. Price Decline (Stock Dividend)

Table 6 compares the expected price adjustment with the ex-stock dividend price. The results show that the number of observations where the expected price adjustment is less than the ex-stock-dividend price is significantly greater than the number of observations where the expected price adjustment is greater or equal to the ex-stock dividend price for both situations.

On the average, the expected price adjustment ² is \$3.3609 as against a ex-stock dividend price of \$3.5722 in cases when bonus and rights issues are considered. This means that on average shareholder stands to gain about 21.1 sen per share if the shareholder wants to take up the stock dividend together with the rights issue. On the other hand, an average investor can expect to gain more (about 21.9 sen per share) if the issue involves only stock dividend. This evidence indicates that stock dividend indeed creates value³. In an efficient market, this profit should not exist because stock price should fully adjust on ex-dates. Hence, our evidence suggests inefficiency in the Malaysian stock market.

TABLE 6
FREQUENCY OF EXPECTED PRICE ADJUSTMENT RELATIVE
TO EX-DATE STOCK PRICE

	Bonus and Rights	Bonus Only
Number Of Observations	85	46
Expected Price > Ex-Date Price	12 (14.1)	7 (15.2)
Expected Price = Ex-Date Price	2 (2.3)	1 (2.2)
Expected Price < Ex-Date Price	71 (83.5)	38 (82.6)
Mean Actual Price (\$)	3.5722	3.9017
Mean Expected Price (\$)	3.3609	3.6822
Investor's Gain (\$)	0.2113	0.2195
T-value	-7.61*	-6.45*

* significant at 0.001 level

Comparing the two gains, the results indicate that rights issue seems to have a negative effect⁴ on bonus issue. When rights is included, the gain is slightly lower than the gain when rights is excluded. This phenomenon may explain that the Malaysian investing public may have some reservations⁵ regarding rights issue.

The expected price adjustment is adjusted by using the closing price of the stock on a day before it goes ex-stock dividend and correct it for market biasness.

US researchers like Chottiner and Young (1971); and Barker (1959) found that stock prices did not fully adjust for stock distribution. In fact, they found that stock dividend created value.

A study conducted by Woolridge (1983) pointed out that the existence of transactions cost and taxes also cause the ex-stock dividend price to be greater than the expected price by a margin equal to the transaction costs and taxes.

One implication of this result is that an arbitrageur can expect to profit (see Table 7) by merely taking up bonus issues only or bonus plus rights issues. In spite of considering the transaction costs incurred for the round trip, it is still profitable for an arbitrageur to trade but the margin of profit is small (about 5.4 sen per share for bonus and rights, and 6.1 sen per share for bonus only).

TABLE 7
TRANSACTION COSTS INCURRED BY AN ARBITRAGER

	Bonus and Rights	Bonus Only
Buying Transaction Cost:		
Brokerage Fee (\$)	0.054	0.054
SCANS Fee (\$)	0.003	0.003
Stamp Duty (\$)	0.006	0.006
Total Buying Transaction Cost (\$)	0.063	0.063
Selling Transaction Cost:		
Brokerage Fee (\$)	0.063	0.064
SCANS Fee (\$)	0.003	0.003
Stamp Duty (\$)	0.007	0.007
Total Selling Transaction Cost (\$)	0.073	0.074
Registration Cost (\$)	0.021	0.021
Overall Transaction Cost Incurred (\$)	0.157	0.158
Gain from Table 7 (\$)	0.211	0.219
Arbitrageur's Gain (\$)	0.054	0.061

⁴ In UK and particularly, the US, most rights issue are treated with great suspicions. The market usually takes a "wait-and-see" attitude and will only react favourably if the investors are convinced that the capital injected into the firm is put into good use resulting in some expected good performance.

⁵ Neoh Soon Kean (1989) observes that the Malaysian investors do not react adversely to bonus and rights issues. In fact, stock price increases when the company announces rights issue.

SUMMARY AND CONCLUSION

This paper examines the stock price behaviour around ex-dividend date. Empirical results on stocks that pay cash dividend indicate that stock prices decline by about 71.5 percent of the full amount of dividend, implying that the marginal tax bracket of the Malaysian investor is about 28.5 percent.

Evidence indicates that clientele effect exists in Malaysia. This finding is similar to Miller's (1970) findings that the clientele effect is direct instead of inverse as reported in the US. However, it remains as an unresolved issue as to why a tax-clientele effect tends to exist in a full tax imputation environment.

Results have shown that stock dividends actually create value on ex-stock dividend days. Our finding indicates that investors stand to gain on bonus issues. However, the gain arises if the bonus is declared with a rights issue. This evidence tends to suggest inefficiency in the stock market.

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