A STUDY OF PRICE-CHANGED-TO-DIVIDEND RATIO ON EX-DIVIDEND DATES: THE CASE STUDY OF STOCK EXCHANGE OF THAILAND IN 2012-2014

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Abstract: *Most of studies had a similar conclusion that the average stock prices on ex-dividend dates tend to be declined according to the corresponding amount of dividend even though it is the Book Value, BV, which is declined by the amount of dividend. As many stock traders did not achieve their results based on this conclusion, the research methodology was repeated to assert the myth. Because none of researches were based on data from the Stock Exchange of Thailand, the research methodology was repeated, only on cash dividends, for years of 2012-2014. Finally, the results were compared with the previous study and test on their difference among industries and years. The result showed that the ratio of different countries, e.g. United States, Japan and Thailand are not the same. However, the result showed no different among industries and years.*

Keywords*: Cash Dividend, Ex-Dividend Date, Stock Price, Thailand.*

1. INTRODUCTION

Cash dividend is one of major concerned in stock trading decisions. As many stock traders performance relied on the relationship between the average stocks price drop-off on the ex-dividend date and the amount of the dividend, the research methodology was performed to assert that.

Campbell & Berarek (1955) found that the average stock price tended to be declined about 90 percent of the amount of the dividend on their ex-dividend dates. Finnerty (1981) presents empirical evidence that lends strong support to the buying-the-dividend hypothesis for electric utility common stocks. In reviewing all of Boyd and Jagannathan (1994) result, it is striking that, at the margin, percentage price drop is almost exactly equal to dividend yield. This result was obtained in a number of different tests-the only significant exception being those tests after negotiated commission rates and with low dividend yield data points excluded. Kato and Loewenstein (1995) calculate the price-changed-to-dividend ratio on the ex-day.

Campbell & Berarek (1955) stated that traders in a 25 percent tax bracket would find equal advantage in trades before and after an ex-dividend date if the price drop-off were 75 to 85 percent of the dividend, while those in a 50 percent bracket would find equal advantage if the drop-off were 50 percent to 66 2/3 percent. This suggests that a fully rational market might make the drop-off between 65 and 75 percent of the dividend-taking into account a market composed of high-bracket individuals, low-bracket individuals, and all manner of corporations, institutions, and fiduciaries. On balance, a tax-paying individual will do better to sell before an ex-dividend date but to buy after it. For a tax-exempt institution, the rule is exactly the reverse.

Finnerty (1981) shown that the relatively high yields that electric utility common stocks afford are attractive to two classes of investors but for different reasons. First, taxable institutions that can claim the 85% dividends received deduction buy electric utility common stocks before the ex-dividend date, hold them long enough to

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qualify for the deduction, and then dispose of the shares. Second, investors in electric utility common stocks, particularly individual investors seeking a regular income flow, are attracted by the high yields these stocks afford.

His results have an important implication for pricing new issues of electric utility common stocks. The buying pressure prior to the ex-dividend date and the selling pressure thereafter imply that the new issue should be priced before rather than just after the ex-dividend date. Waiting until after the ex-dividend date to price will expose the issuer to the risk that the price will be depressed by more than the amount of the dividend, whereas pricing before the ex-dividend date will enable the utility to take advantage of the positive effects that dividend buying and dividend preference generally have on the common stock price.

Kato and Loewenstein (1995) found that return patterns around ex-dividend days are dominated by the institutional regularity of many of the ex-dividend days coinciding with the first trading day of record of a new fiscal year. This conclusion accounts, on average, for excess returns of almost 1 percent independent of any dividend-related considerations.

To summarize, these recommendations were derived from studies of the relationship between dividends and stock prices on ex-dividend dates.

Statement of Problem

One of the fundamental models of common stock valuation holds that a company's share price is equal to the discounted value of its future dividend stream, Finnerty (1981). Durand & May (1960) also stated that the stock price on xd date drop by the amount dividend.

For more updated result, the research methodology was repeated to assert that "the average stock price drop-off on the ex-dividend date tends to be about 90 percent of the amount of the dividend when the stock market is otherwise stable."

2. LITERATURE REVIEWS

The behavior of stock prices around ex-dividend dates is of interest to many financial researchers. It is quite convincing that the price of equity on XD-date is declined by the amount of dividend paid even though it is the Book Value, BV, that is declined by the amount of dividend. Many researchers, i.e., Campbell & Beranek (1955), Durand & May (1960), and Finnerty (1981), concluded that the average stock prices on ex-dividend dates tend to be declined by approximately 90 percent of the amount of dividend.

Two bits of evidence from Campbell & Berarek (1955) point to the conclusion that the stock exchange practice of marking down open bids on the ex-dividend day by the full amount of the dividend is a significant factor in the price drops. This situation makes it advisable for a tax-paying prospective seller to sell before rather than after an ex-dividend date, other things being equal, since our data indicate a probable price drop-off on the ex-date of about 90 percent of the dividend. The major conclusions to be derived from the foregoing data have already been stated. However, one item will bear repetition: on balance, a tax-paying individual will do better to sell before an ex-dividend date but to buy after it. For a tax-exempt institution, the rule is exactly the reverse.

Finnerty (1981) showed that the relatively high yields that electric utility common stocks afford are attractive to two classes of investors but for different reasons. First, taxable institutions that can claim the 85% dividends received deduction buy electric utility common stocks before the ex-dividend date, hold them long enough to qualify for the deduction, and then dispose of the shares. Second, investors in electric utility common stocks, particularly individual investors seeking a regular

income flow, are attracted by the high yields these stocks afford.

The results presented here have an important implication for pricing new issues of electric utility common stocks. The buying pressure prior to the ex-dividend date and the selling pressure thereafter imply that the new issue should be priced before rather than just after the ex-dividend date. Waiting until after the ex-dividend date to price will expose the issuer to the risk that the price will be depressed by more than the amount of the dividend, whereas pricing before the ex-dividend date will enable the utility to take advantage of the positive effects that dividend buying and dividend preference generally have on the common stock price.

In reviewing all of Boyd and Jagannathan (1994) result, it is striking that, at the margin, percentage price drop is almost exactly equal to dividend yield. This result was obtained in a number of different tests-the only significant exception being those tests after negotiated commission rates and with low dividend yield data points excluded.

Kato and Loewenstein (1995) stated that the price-changed-to-dividend ratio is most negative for low-yield securities and increases gradually as the mean dividend yield increases, becoming positive (0.165) for the highest dividend yield quintile.

Because none of researches were based on data from the Stock Exchange of Thailand, the research methodology was repeated, only on cash dividends, for years of 2012-2014. Finally, the results were compared with the previous study and test on their difference among industries and years.

3. RESEARCH DESIGN

There are many researches provides recommendations based on studies of the relationship between dividends and stock prices on ex-dividend dates.

Campbell & Berarek (1955) stated that traders in a 25 percent tax bracket would find equal advantage in trades before and after an ex-dividend date if the price drop-off were 75 to 85 percent of the dividend, while those in a 50 percent bracket would find equal advantage if the drop-off were 50 percent to 66 2/3 percent. This suggests that a fully rational market might make the drop-off between 65 and 75 percent of the dividend-taking into account a market composed of high-bracket individuals, low-bracket individuals, and all manner of corporations, institutions, and fiduciaries. On balance, a tax-paying individual will do better to sell before an ex-dividend date but to buy after it. For a tax-exempt institution, the rule is exactly the reverse.

Kato and Loewenstein (1995) found that return patterns around ex-dividend days are dominated by the institutional regularity of many of the ex-dividend days coinciding with the first trading day of record of a new fiscal year. This conclusion accounts, on average, for excess returns of almost 1 percent independent of any dividend-related considerations.

3.1 Theoretical Framework

Kato and Loewenstein (1995) calculate the price-changed-to-dividend ratio on the ex-day. This ratio is calculated with closing prices on the cum-dividend day and opening prices on the ex-day.

Finnerty (1981) test the dividend preference hypothesis by examining the size of the decline in price of utility common stocks on their ex-dividend date relative to the size of the dividend:

$$y = Yt/Dt,$$

where Yt is the difference between the closing prices on the ex-dividend date and the next preceding trading day, and Dt is the amount of the dividend paid at t.

3.2 Conceptual Framework

H1: An average price-changed-to-dividend ratio is equal to -0.9.

This hypothesis aims to assert whether an inferential estimation of price-changed-to-dividend ratio is equal to -0.9.

(Campbell & Berarek, 1955) The inferential statistic is employed in order to estimate the interval from the obtained data.

H2: Average price-changed-to-dividend ratio is equal to previous studies.

The second hypothesis represents a comparison between the price-changed-to-dividend of two independent samples of stocks. The t-ratio is employed in order to make comparisons between two means when interval data have been obtained.

H3: Annual Average price-changed-to-dividend ratios are all equal regardless of the year.

The third hypothesis represents a comparison of the price-changed-to-dividend among three independent samples of stocks. The F-ratio, analysis of variance, is employed in order to make comparisons among three or more independent means when interval data have been obtained.

Unlike other studies that divide the stocks based on their value, this research categorizes all stocks based on their industry.

H4: Average price-changed-to-dividend ratios are all equal regardless of the industry.

The last hypothesis also represents a comparison between the ratios of three or more independent samples of stocks. The F-ratio is employed in order to make comparisons between three or more independent means when interval data have been obtained.

3.3 Research Methodology

Campbell & Berarek (1955) presented statistical evidences on 399 dividend payments that seem to show a tendency for stocks to drop-off by less than the amount of their dividends. Two tests were made; one using dates falling between October, 1949 and April, 1950, and the second covering the last three months of 1953.

The 1949-50 test covered 199 cases, the majority chosen from days in which the ranges of the Dow-Jones Composite Average did not exceed .25, and in which the opening Average on the ex-dividend day did not suffer from the previous day's close by more than this amount. In this test all stock price changes were measured from the closing price of the preceding day to the opening price on the ex-dividend day. This test shows a median price drop-off of approximately 92 percent of the dividend, with about 89 percent for 104 50-cent dividends and 95 percent for 95 larger dividends.

The 1953 test was based on 200 dividends, 20 cases each of amounts of $.375, $.50, $.625, $.75, $.875, $1.00, $1.25, $1.50, $1.75, and $2.00. In this instance the price changes were measured in two ways: (a) between the ex-dividend opening sale and the previous day's close and (b) between the averages of the high-low prices for the two days. No attempt was made to select dates on which the general market was stable, a factor which may have caused the average price drop-off to be minutely smaller than it would otherwise have been. Median drop-offs on these 200 cases were 96 percent on the closing-to-opening basis and 83 percent on the average-price basis. The individual percentages were again widely scattered, with no significant modal tendency; moreover, out of 200 cases studied, 14 stocks actually rose in price when they sold ex-dividend, and 14 declined by 200 percent of the dividend or more.

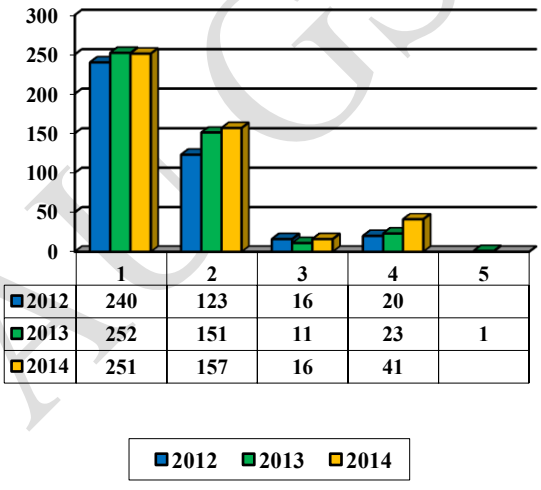
To test the buying-the-dividend hypothesis, Finnerty (1981) added eight dummy variables, and then tested the relationship using the 164 sample periods. Each dummy variable dj equals one at time x = j and zero otherwise. The coefficient of the dummy variable dj measures the degree of deviation of the actual observations from the exponential time path at time x = j. This degree of deviation serves as a proxy for the degree of abnormal buying pressure in each of the weeks immediately preceding the ex-dividend date and the degree of abnormal selling pressure in each of the weeks immediately following the ex-dividend date.

Boyd and Jagannathan (1994) use daily closing prices for individual stocks for the period from July 1962 to December 1987 from the CRSP Daily Master, along with information regarding the date on which the stock went ex-dividend and the amount and tax status of the dividends. The sample is limited to ordinary, taxable, cash dividends. There were a total of 142,589 such dividends. For some of the stocks that paid cash dividends, part of the dividend was taxable and part tax-exempt. Also, for some stocks that were going ex-dividend, there was more than one type of dividend being paid. We omitted 10,532 ex-dividend days that had this feature. This left a total of 132,057 ex-dividend days.

In this study, all dividend payment data were collected from Icedos (2012-2014). The Microsoft Excel 2007 is used to perform all Data Analysis. The missing prices are filled with the price of nearest day.

4. RESULTS

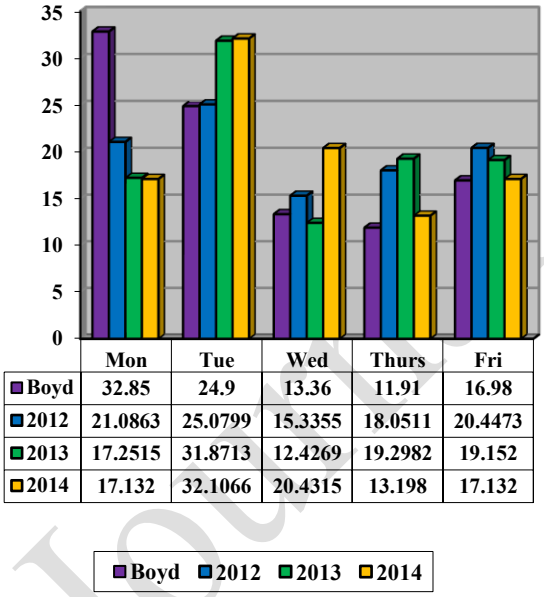
Out of 674 registered companies, there were 406, 438, and 466 companies paid totals of 626, 684, and 787 cash dividend, respectively.



	1	2	3	4	5
2012	240	123	16	20	
2013	252	151	11	23	1
2014	251	157	16	41	

Fig.1. Amount of companies with their corresponding amount of dividend payments

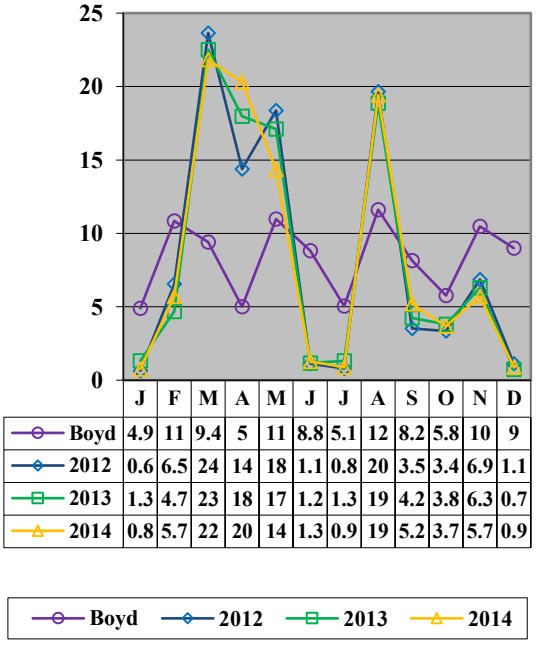
From Figure 1, most companies paid dividend once a year, some paid twice a year, and there were more companies paid dividend quarterly than either 3 or 5 times a year.



	Mon	Tue	Wed	Thurs	Fri
Boyd	32.85	24.9	13.36	11.91	16.98
2012	21.0863	25.0799	15.3355	18.0511	20.4473
2013	17.2515	31.8713	12.4269	19.2982	19.152
2014	17.132	32.1066	20.4315	13.198	17.132

Fig.2. Percentage Distribution of ex-dividend dates by day of the week

Compared with Panels B in Boyd's Table 1, Figure 2 reports the day of the week. Whereas Monday is, by far, the most common day of the week in his study, Tuesday is, however, the most common day of the week in this study.



	J	F	M	A	M	J	J	A	S	O	N	D
Boyd	4.9	11	9.4	5	11	8.8	5.1	12	8.2	5.8	10	9
2012	0.6	6.5	24	14	18	1.1	0.8	20	3.5	3.4	6.9	1.1
2013	1.3	4.7	23	18	17	1.2	1.3	19	4.2	3.8	6.3	0.7
2014	0.8	5.7	22	20	14	1.3	0.9	19	5.2	3.7	5.7	0.9

Fig.3. Percentage Distribution of ex-dividend dates by month

Compare with Boyd's Panels C in Table 1, Figure 3 reports the seasonal patterns in the occurrence of ex-dividend days. Relatively larger fractions of the ex-days occur in the months of February, May, August, and November. This quarterly pattern is expected since, for a relatively large fraction of stocks, fiscal and calendar quarters coincide. For such firms the ex-dividend days tend to occur one month after the end of the quarter.

H1: An average price-changed-to-dividend ratio is equal to -0.9.

The average price-changed-to-dividend ratio in 2012-2014 is -5.377, with standard deviation equal to 56.950.

The two sided interval estimation with 5% alpha is -5.377 +/- 0.05431 so there is sufficient evidences to reject the null hypothesis. Therefore, an average price-changed-to-dividend ratio is not equal to -0.9.

H2: An average price-changed-to-dividend ratio is equal to all previous studies.

	AP/D	Boyd	Kato
Mean	-5.377	-0.707	0.5063
StDev	56.950	5.693	
CoD (%)	1059.172	805.233	

Table 1: Comparison of average price-changed-to-dividend ratio and its standard deviation among previous studies

The average price-changed-to-dividend ratio is compared with previous researches in the Table 1. Notice that the ratio from Kato is negative (-0.5063 for the sample excluding rights issues), implying price increases on the ex-dividend day. Kato explained that the ratio is more negative after the tax changes went into effect in April 1989, which taxes capital gains for individuals in Japan for the first time, makes dividends relatively more attractive for these investors.

The two sided p-value is 0.0002 which is lower than 5% alpha so there is sufficient evidences to reject the null hypothesis. Therefore, an average price-changed-to-dividend ratio is not equal to Boyd's one.

H3: Thai average price-changed-to-dividend ratios are all equal regardless of the industry.

Industry	Amount	Mean	StDev	CoD (%)
Consumer Products	133	-2.176	6.201	284.995
Industrials	299	-3.416	13.021	381.196
Agro & Food Industry	165	-2.689	13.403	498.430
Resources	141	-5.556	25.541	459.664
Technology	161	-5.872	24.403	415.565
Financials	216	-15.449	166.722	1079.129
Property & Construction	584	-3.612	21.465	594.272
Services	376	-5.957	21.979	368.971
Others (ETF,MAI)	22	-4.822	9.169	190.149
Overall	**2,097**	**-5.377**	**56.950**	**1059.172**

Table 2: Comparison of average price-changed-to-dividend ratio among sectors

The average price-changed-to-dividend ratio is compared among industries in the Table 2.

	SS	df	MS	F	P
Between	27,613.445	8	3,451,681	0.125	0.998
Within	57,570,589.117	2,088	27,572.121		
Total	57,598,202.561	2,096			

Table 3: Analysis of Variance

From Table 3, F-ratio is 0.125, with p-value is 0.998 which is higher than 5% alpha so there is not sufficient evidences to reject the null hypothesis. Therefore, average price-changed-to-dividend ratios in 2015 are all equal regardless of the industry.

H3: Annual average price-changed-to-dividend ratios are all equal regardless of the year.

AP/D	2012	2013	2014
N	626	684	787
Mean	-2.1855	-9.3362	-4.2747
StDev	11.321	95.3362	24.0246
CoD (%)	519.842	1000.0126	563.95

Table 4: Comparison of average price-changed-to-dividend ratio and its standard deviation among years

The average ratio of year 2013 is lower than others. This is because of the flood disaster in year 2013.

	SS	df	MS	F	P
Between	18,042.569	2	9,021.285	2.802	0.061
Within	6,741,548.609	2,094	3,219.460		
Total	6,759,591.178	2,096			

Table 5: Analysis of Variance

From Table 5, F-ratio is 2.802, with p-value is 0.061 which is higher than 5% alpha so there is not sufficient evidences to reject the null hypothesis. Therefore, annual average price-changed-to-dividend ratios are all equal regardless of the year.

DISCUSSIONS AND CONCLUSIONS

The results showed some significant point

1. An average price-changed-to-dividend ratio (-5.377) is less than -1. This result shows that investors exhibit a relative preference for dividends over capital gains.
2. Compared with -0.9 (Campbell and Berarek, 1955), -0.707 (Boyd and Jagannathan, 1994), and 0.5063, (Kato, 1995) an average price-changed-to-dividend ratio is not the same. This might be because of impacts from time, i.e. and place.
3. Average price-changed-to-dividend ratios are not different among industries. This imply that this ratio are not relied on industry different.
4. Although, annual average price-changed-to-dividend ratios are not different among years, there is a sign of different when a huge event occurred.
5. This imply the ratio would be effected more by event in that time of trading rather than the different of industry.

One limitation is that the stock price is continuously varied on ex-dividend date. The author can only captured the closing price, not all traded price. There are only 3 years of study, 2012-2014, so the result might not represent the other years. In addition, some stocks did not have any trade on ex-dividend date so we use the price of the nearest day after. All data are assumed to be normal distributed.

To summarize, the existing literature has isolated three important stylized facts about dividend buying decision. First, transactions costs affect pricing and must be taken into account in empirical research on this topic. Second, several classes of traders may trade around ex-dates, with systematically different taxes and/or transactions costs. Third, dividend capture activities represent a substantial amount of ex-day trading, primarily for high dividend yield stocks.

REFERENCES

Boyd, John H. and Jagannathan, Ravi. (1994) "Ex-Dividend Price Behavior of Common Stocks," The Review of Financial Studies, Vol. 7, No. 4 (Winter, 1994), pp. 711-741.

Campbell, James A. and Beranek, William. (1955) "Stock Price Behavior on Ex-Dividend Dates," The Journal of Finance, Vol. 10, No. 4 (Dec., 1955), pp. 425-429.

Chow, Gregory C. (1960) "Tests of Equality between Sets of Coefficients in Two Linear Regressions," Econometrica, Vol. 28, No. 3 (July 1960), pp. 591-605.

Duran, David and May, Alan M. (1960) "The Ex-Dividend Behavior of American Telephone and Telegraph Stock," The Journal of Finance, Vol. 15, No. 1 (Mar 1960), pp. 19-31.

Elton, E. J. and Gruber, M. J. (1970) "Marginal Stockholder Tax Rates and the Clientele Effect," Review of Economics and Statistics, (February 1970), pp. 68-74.

Finnerty, John D. (1981) "The Behavior of Electric Utility Common Stock Prices near the Ex-Dividend Date," Financial Management, Vol. 10, No. 5 (Winter, 1981), pp. 59-69.

Icedos. (2014) Summary of Dividend Paid. Retrieved from http://www.icedos.com/

Kato, Kiyoshi and Loewenstein, Uri. (1995) "The Ex-Dividend-Day Behavior of Stock Prices: The Case of Japan," The Review of Financial Studies, Vol. 8, No. 3 (Autumn, 1995), pp. 817-847.

Paternoster, Raymond; Brame, Robert; Mazerolle, Paul and Piquero, Alex. (1998) "Using the Correct Statistical Test for the Equality of Regression Coefficients," Criminology, Vol. 36, Issue 4 (November 1998), pp. 859-866.