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PAPER

Does Dividend Policy Determine Stock Price Volatility? (A Case Study of Malaysian Manufacturing Sector)

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Abstract The paper aims to investigate the association between dividend policy and stock price volatility in Malaysian context. The study used multiple regression analysis to explore the association between stock price volatility and both dividend payout ratio and dividend yield. On the basis of diagnostic tests, the study elaborates the results of random effect model. The result is in line with prediction showing that any increase in dividend payout will minimize the stock price volatility. As there is high correlation between dividend yield and dividend payout, the results showed positive and insignificant association between dividend yield and price volatility. The control variables are used in order to address the issue of multicollinearity and to observe if there would be any change in the coefficient of dividend yield. The results show that there is a significant change in dividend yield and the coefficient value changed into negative. Similarly, the results of other variables are also as per expectation. This explains the fact that dividend policy on its own is not the determining factor of price volatility. There are certain other factors that also contribute in measuring stock price volatility. As per results, firm's size is also negatively associated with stock price volatility. The firms with high level of market capitalizations are better in managing their stock price volatility as compared to their counterpart. Moreover, the mature firms are also efficient in managing their stock prices and firm's age is negatively associated with stock price volatility. In contrast, the debt ratio is negatively significant which shows that high levered firms have high volatile stock operating in market. Lastly, the earnings volatility shows insignificant effects on stock price volatility.

Keywords: Malaysia; Dividends policy; stock price; random effect model.

1. Introduction

Since the publication of dividend irrelevancy hypothesis, dividend policy has remained one of the most debatable issues in corporate finance (Allen, Bernardo, and Welch, 2000, p. 2499; Ho, 2003; Denis, D.J. and Osobov, I., 2007; Bhattacharyya,

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2007). It's not only the amount involved and the rhythmic nature of dividend payout that make the topic critical, but also the complex associations with most investment and other financial policies (Allen and Michaely 1994). The controversy stems from the irrelevance theory of Miller and Modigliani (1961) based on the assumption of a perfect market. In emerging markets, the perfect market assumption seems to be a reverie (Vasicek and McQuown, 1972). Quite a few hypothetical models are used to clarify corporate dividend policy but still it remains a puzzle (Baker et al., 2002, p. 255). As per signalling models, managers are equipped with more information about the firm's future prospects than outside stakeholders, and they have the options and incentives to convey the information to investors (Gugler, 2003). Any abrupt change in dividend policy is used to mitigate information between managers and stakeholders (Frankfurter and Wood Jr., 2002). Similarly, agency model explains that dividend payout can be used as a constraint on discretionary management action and better aligns the interests of stockholders (Jensen, 1986).

The absence of an adequate theory to explain the determinants of dividend policy and the observed effect of a firm's dividend policy on its stock prices is coherently stated by Black (1976) and Brealey and Myers (2003), who contend that the "dividend controversy" is of the ten unresolved problems in finance that are "ripe for productive research". DeAngelo and DeAngelo (2006) challenged Black's proposition and stated that this "puzzle" is not a puzzle because it is rooted in the mistaken idea that Miller and Modigliani's (1961) irrelevance theorem applies to payout/retention decisions. Bhattacharyya (2007) was unconvinced by that argument, and concluded that dividend policy remains a puzzle; despite focused extensively. These conclusions echo the view of Baker et al. (2002, p. 255), who assert that "despite a voluminous amount of research, we still do not have all the answers to the dividend puzzle". The following controversies adds to Bhattacharyya (2007) conclusion that dividend seems to be puzzles, with such pieces that don't fit together.

2. Theories of Dividend Policy

A numerous studies on dividend policy clearly show that dividend policy has been a strong bone of contention in the area of finance. This starts from Lintner (1956) to Miller and Modigliani (1961) to Bhattacharya (1979) and, more recently, DeAngelo et al. (1996), Fama and French (2001), Al-Malkawi (2007) and Al-Najjar and Hussainey (2009). Some of the theories related to dividend policy and stock price reaction are mentioned as under:

2.1 Dividend Irrelevance Theory

According to Miller and Modigliani (1961), dividend policy is irrelevant to the stockholders and that shareholder wealth remains unchanged when all aspects of investment policy are fixed and any increase in the current payout is financed by fairly priced stock sales. It is assumed that management distribute 100% dividend every year and the other assumption are; There is a perfect capital market; that is, no transaction cost

or taxes, a single buyer or seller cannot influence market price of a stock and complete information is available to all potential users; The investors are rational and their stock value is based on discounted future cash flows; The management (agent) acts in the best interest of their owners (principal) agents of shareholders; and that there is certainty about the investment policy of the firm, with full knowledge of future cash flows.

2.2 Bird-In-Hand Theory

According to Al-Malkawi (2007), in a world of information asymmetry and uncertainty, dividends are treated differently from retained earnings (capital gains): "A bird in hand (dividend) is worth more than two in the bush". The dividend has been the preferred choice of the investors rather than retained earnings. Despite a lot of criticism, the argument has been supported by Gordon and Shapiro (1956), Lintner (1962) and Walter (1963). It is based on assumptions; The investors are perfectly aware of firms profitability and other performances; The cash dividend are exposed to higher rate of taxation than capital gains realized on sale of stock; Dividends function as a signal of expected future cash flows. Al-Malkawi (2007) also assumed that assets in which management invest outlive management's stay in their position and that ownership of the assets is transferred to new management over time.

2.3 Agency cost and the free cash flow theory.

Agency cost is the cost of the conflict of interest that exists between shareholders and management (Ross et al., 2008). This arises when management acts in their interest rather than on behalf of the shareholders who own the firm. This could be direct or indirect. This is contrary to the assumptions of Miller and Modigliani (1961), who assumed that managers are perfect agents for shareholders and no conflict of interest exists between them. This is somewhat questionable, as the owners of the firm are different from the management. Managers are bound to conduct some activities, which could be costly to shareholders, such as undertaking unprofitable investments that would yield excessive returns to them, and unnecessarily high management compensation (Al-Malkawi, 2007). These costs are borne by shareholders; therefore, shareholders of firms with excess free cash flow would require high dividend payments instead. Agency cost may also arise between shareholders and bondholders: while shareholders require more dividends, bondholders require fewer dividends than shareholders by putting in place a debt covenant to ensure availability of cash for their debt repayment. Easterbrook (1984) also identified two agency costs: the cost of monitoring managers and the cost of risk aversion on the part of managers.

2.4 Signaling Hypothesis

Though Miller and Modigliani (1961) assumed that investors and management have perfect knowledge about a firm, this has been countered by many researchers, as management who look after the firm tend to have more precise and timely information about the firm than outside investors. This, therefore, creates a gap between managers

and investors; to bridge this gap, management use dividends as a tool to convey private information to shareholders (Al-Malkawi, 2007). Petit (1972) observed that the amount of dividends paid seems to carry great information about the prospects of a firm; this can be evidenced by the movement of share price. An increase in dividends may be interpreted as good news and brighter prospects, and vice versa. But Lintner (1956) observed that management are reluctant to reduce dividends even when there is a need to do so, and only increase dividends when it is believed that earnings have permanently increased.

2.5 Clientele Effects of Dividends Theories and Stock Price Volatility

Investors tend to prefer stocks of companies that satisfy a particular need. This is because investors face different tax treatments for dividends and capital gains and also face some transaction costs when they trade securities. Miller and Modigliani (1961) argued that for these costs to be minimised, investors tend towards firms that would give them those desired benefits. Likewise, firms would attract different clientele based on their dividend policies. Though they argued that even though clientele effect may change a firm's dividend policy, one clientele is as good as another, therefore dividend policy remains irrelevant. Al-Malkawi (2007) affirms that firms in their growth stage, which tend to pay lower dividends, would attract clientele that desire capital appreciation, while firms in their maturity stage, which pay higher dividends, attract clientele that require immediate income in the form of dividends. Al-Malkawi (2007) grouped the clientele effect into two groups, those that are driven by tax effects and those driven by transaction cost. He argued that investors in higher tax brackets would prefer firms that pay little or no dividends, to get reward in the form of share price appreciation, and vice versa. Transaction cost-induced clientele, on the other hand, arises when small investors depend on dividend payments for their needs; this clientele prefers companies who satisfy this need because they cannot afford the high transaction cost of selling securities.

3. Variables

3.1 Dependent Variable (Price Volatility)

Price volatility is the dependent variable. It is based on the annual range of adjusted stock price obtained from Datastream, for each year. The range is then divided by the average of the highest and lowest prices obtained in the year and then squared. This was averaged for all available years and a square root transformation was applied so as to obtain a variable comparable to a standard deviation (Baskin, 1989).The use of proxy for share price volatility rather than standard deviation was deliberate. This is basically because standard deviation could be influenced by extreme values. Again, our approach is in line with Baskin's (1989), whose study forms the theoretical framework of this research.

3.2 Independent Variables

1. Dividend Yield

This is expressed as the dividend per share as a percentage of the share price. Figures were obtained directly from Datastream. Dividend is calculated on gross dividends, i.e. excluding tax credits. The average was taken for all available years. The study develops following hypothesis for the purpose of analysis.

Ha: dividend yield has negative significant impacts on dividend policy of the Malaysian firms.

2. Payout Ratio

This is the ratio of dividends per share to earnings per share for all available years. The average over all available years was utilised. The figures were obtained directly from Datastream. The study develops following hypothesis for the purpose of analysis.

Hb: dividend payout has negative significant impacts on dividend policy of the Malaysian firms.

3.3 Control Variables

1. Size (Market Value)

This is the share price multiplied by the number of ordinary shares in issue. A transformation using the base 10 logarithm was then applied to obtain a variable that reflects orders of magnitude. The figures were obtained directly from DataStream. The study develops following hypothesis for the purpose of analysis.

Hc: firm's size positively affects dividend policy of Malaysian firms.

2. Earnings Volatility

Earnings figures were obtained from DataStream. These figures represent the earnings before interest and taxes. Following Dichev and Tang (2009), earnings volatility is calculated by taking the standard deviation of earnings for the most recent preceding five years for each year. The study develops following hypothesis for the purpose of analysis.

Hd: Earning volatility negatively affects dividend policy of Malaysian firms.

3. Long-Term Debt (Debt)

Figures for long-term debt and total assets were obtained directly from Datastream. These figures represent all interest-bearing financial obligations, excluding amounts due within one year, e.g. debentures, mortgages and loans with maturity greater than one year. It is shown net of premiums or discount. The ratio of long-term debt to total assets was calculated and the average over all available years was utilised. The study develops following hypothesis for the purpose of analysis.

He: long term debt negatively affects dividend policy of Malaysian firms.

4. Growth in Assets (Growth)

Figures for growth in assets were obtained directly from Datastream. These figures were obtained by taking the ratio of the change in total assets at the end of the year

to the level of total assets at the beginning of the year. These figures were averaged over all available years. The study develops following hypothesis for the purpose of analysis.

H f: Firm's growth positively affects dividend policy of Malaysian firms.

Table 1. Variable and their Definitions

Variables	Definition	Symbol	References	Expected sign
Price Volatility	It is based on the annual range of adjusted stock price divided by the average of the highest and lowest prices obtained in the year and then squared.	PV	(Baskin, 1989).	Dependent variable
Dividend yield	Dividend per share as a percentage of the share price	DIVY	Dichev and Tang (2009)	Negative
Payout ratio	Ratio of dividends per share to earnings per share for all available years	PAYR	Dichev and Tang (2009)	Negative
Firm Size	Share price multiplied by the number of ordinary shares in issue	FS	Dichev and Tang (2009)	Negative
Earnings Volatility	Standard deviation of earnings for the most recent preceding three years for each year.	EV	Baskin, (1989), Dichev and Tang (2009)	Positive
Long-term debt	Ratio of long-term debt to total assets	DR	Baskin, (1989), Dichev and Tang (2009)	Positive
Growth in assets	Ratio of the change in total assets at the end of the year to the level of total assets at the beginning of the year	AG	Baskin, (1989), Dichev and Tang (2009)	Positive

4. Methodology for Stock Price Volatility

The relationship between ordinary stock price volatility and dividend policy has been analysed utilising multiple pool and panel data analysis. The regression model developed basically relates price volatility with the two main measures of dividend policy –dividend yield and dividend payout ratio. In line with the recommendations by Baskin (1989), a number of control variables were included to account for certain factors that affect both dividend policy and stock price volatility – asset growth, earnings volatility and firm size. The model was evaluated annually over the ten-year period to measure the periodic effect of dividend policy on stock price volatility. Multiple regression analysis was used to describe these relationships and a correlation analysis was done amongst the variables.

First, the dependent variable price – volatility is regressed against the two main independent variables, dividend yield and payout ratio. This provides a crude test of the relationship between share price volatility and dividend policy with the regression equation:

$$PV = \alpha_1 + \alpha_2 DIVY_t + \alpha_3 PAYR_t + \mu_t$$

Baskin's (1989) analysis showed a significant negative relationship between dividend yield and dividend payout and share price volatility. Allen and Rachim (1996) reported a positive relationship between share price volatility and dividend yield, but a negative relationship between share price volatility and dividend payout. The close relationship between dividend yield and dividend payout ratio may pose a small problem as there are a number of factors that influence both dividend policy and price volatility. To limit these problems, the control variables mentioned earlier were included in the analysis. The dependent variable was regressed against the two independent variables and the control variables with the following regression equation:

$$EV = \alpha_1 + \alpha_2 DIVY_t + \alpha_3 PAYR_t + \alpha_4 FS_t + \alpha_5 DR_t + \mu_t$$

5. Stock Price Volatility

Table 2 shows a broad description of the summary statistics of the variables used in the study. It shows the statistical mean, standard deviation, median, skewness, Kurtosis and standard error. According to Allen and Rachim (1996), assuming that stock prices follow a normal distribution pattern and ignoring the effect of a firm's going ex-dividend, the standard deviation of stock market returns is equivalent to the measured volatility of the study. This can be done using the formula derived by Parkinson (1980), in line with Baskin (1989). Here, the mean price volatility, 0.3329, is multiplied by the constant, 0.6008, giving a result of 20.00 per cent. This is in line with Allen and Rachim's (1996) result regarding Australian firms, which was 29.42 per cent, and Baskin's (1989) result regarding US firms, which was 36.9 per cent.

Table 2. Descriptive Statistics

	PV	EV	FS	EPS	DPS	DE	AG
Mean	0.3329	0.3124	633784	11.70912	0.088285	2.173845	0.259615
Med	0.0072	0.1040	167957	7.08	0.04765	0.884948	0.121332
Max	2.5734	804.6923	287789	781.91	3.61564	278.4518	27.22064
Min	-2.6206	-130.9	-104195	-369	0.01	4.29E-06	-3.75122
Std. Dev.	0.26574	9.948433	2009208	33.86192	0.212504	8.312491	0.785049
Skewness	-11.1736	76.76464	8.233382	5.183905	10.48049	19.76752	16.31316
Kurtosis	308.2953	6233.968	85.11295	90.56628	138.1941	506.9804	461.1087

Table 3 presents the correlation amongst the variables utilized for the study. From the table, it can be seen that the correlation between price volatility and dividend yield is negative (24.74). As expected, this is in line with that of Baskin (1989), which was 20.643, but it is in contrast with that of Allen and Rachim (1996), which was positive (0.006). Also, the correlation between price volatility and dividend payout is negative (11.8), as expected and in line with the correlation in both Baskin (1989), which was 20.542, and Allen and Rachim (1996), which were 20.21. The correlation table also shows a high correlation between dividend yield and payout, with value 0.6501 (approximately 70 per cent). This raises questions as there is the possibility of multicollinearity, which could be a potential problem. Multicollinearity persist when the correlation between two independent variables is equal to or greater than 70 per cent (Drury, 2008). There is therefore the need to include the control variables in the regression equation to see if there would be changes. This is consistent with Allen and Rachim (1996). Earnings volatility has a negative correlation with both dividend yield and payout ratio. This is in line with expectation, as firms with volatile earnings are perceived to be more risky and management tends to pay lower dividends to have enough retained earnings for years when earnings are bad; this in turn affects dividend yield.

Table 3. Correlation Matrix

	Price volatility	Earning volatility	Firm size	Dividend yield	Dividend payout	Debt ratio	Firm's age
Price volatility	1						
Earning volatility	0.2342	1					
Firm size	-0.431	-1.76E-03	1				
Dividend yield	0.2474	2.9E-02	0.1703	1			

Dividend payout	-0.1186	-0.003912	-0.026	0.6501	1		
Debt ratio	-0.022	2.52E-03	0.1077	0.054	0.0167	1	
Firm's age	0.0242	-0.0070	0.2505	0.0605	-0.037	-0.02	1

6. Regression Results

Table 4 shows the results obtained from first model. The results of the random effect models show that dividend payout is negatively significant at 1% level. The result is in line with prediction showing that any increase in dividend payout will minimize the stock price volatility. As there is high correlation between dividend yield and dividend payout, the results showed positive and insignificant association between dividend yield and price volatility. The results reported by Hussainey et al. (2011) also showed positive and insignificant association between dividend yield and stock price volatility. As there was high correlation between dividend yield and dividend payout in the results reported by Hussainey et al. (2011), this positive association may be a factors which caused the contrary results. In the study, the correlation between them is also on the higher side, which creates the threats of multicollinearity and the results are as contradictory.

Table 4. Relation between Price Volatility, Dividend Yield and Dividend Payout

	Pool model			**Random effect model**			**Fixed effect model**		
Variable	Coeff	t-Stat	Prob.	Coeff	t-Stat	Prob.	Coeff	t-Stat	Prob.
Dividend yield	0.273	1.43	0.511	0.322	1.22	0.221	0.00212	1.17	0.321
Dividend payout	-0.12***	-1.64	0.091	-0.11***	-4.40	0.000	-0.11***	-4.00	0.001
C	0.229***	7.93	0.001	0.230***	3.83	0.000	0.240***	11.6	0.001
R-squared	0.412			0.432			0.484		
Adj R-squared	0.401			0.413			0.432		
F-statistic	4.31			2.781			9.36		
D-Watson stat	1.58			1.53			1.54		
Lagrange multiplier test	0.59***		0.004						
Hausman test				0.829**		0.0246			

*, **, and *** represents significance at the 10, 5, 1 percent levels, respectively

In the second model, the control variables are used in order to address the issue of problem of multicollinearity and to observe if there would be any change in the coefficient of dividend yield. The model is applied and results are presented in table 4. As the results show that there is a significant change in dividend yield and the coefficient value changed in negative. Similarly, the results of other variables are also as per expectation. In table 4, it is observed that the coefficient of dividend yield became

negative, and all other variables were exactly as expected. This explains the fact that dividend policy on its own is not the determining factor of price volatility. There are certain other factors that also contribute in measuring stock price volatility. As per results, firm's size is also negatively associated with stock price volatility at a significant level of 1%. The firms with high level are market capitalizations are better managing their stock price volatility as compared to their counterpart. Moreover, the mature firms are also efficient in managing their stock prices and firm's age is negatively associated with stock price volatility. In contrast, the debt ratio is negatively significant at 1% which shows that high levered firms has high volatile stock operating in market. Lastly, the earnings volatility shows insignificant effects on stock price volatility. These results are consistent with Allen and Rachim (1996).

Table 5. Relationship with Control Variables

Pool model			
Variable	Coefficient	t-Stat	Prob.
Dividend yield	-0.02654***	-3.410	0.00
Dividend payout	-0.3141***	-3.338	0.00
Earning volatility	6.1E-05	1.008	0.31
Firm's size	-1.7E09***	-3.186	0.00
Debt ratio	0.0374***	5.876	0.00
Firm's growth	-0.0190**	-2.156	0.02
C	-0.0261***	-3.065	0.00
R-squared	0.4440		
Adj R-squared	0.4239		
F-statistic	4.6273		
D-Watson stat	1.9914		

*, **, and *** represents significance at the 10, 5, 1 percent levels, respectively

7. Conclusion

This chapter aims to highlight the impacts of dividend policy on firm's stock price volatility. For the purpose of analysis, only those firms are included that distribute dividend during 2002 to 2013. In order to present true picture, the control variables are also included to justify the statement that dividend policy determines the stock price volatility. The control variables include firm's size, firm's age, and debt ratio and earnings volatility. Dividend yield and dividend payout ratio are used as two measures of dividend policy. Due to high correlation between dividend yield and dividend payout ratio, the results of dividend yield are controversial (opposite and insignificant). In order to address the issue, control variables were included and the results are in vein with expected sign and significant level. The empirical findings suggest that there is a significant negative

relationship between dividend yield and payout ratio of a firm, and the volatility of its stock price. This is consistent with the findings of Allen and Rachim (1996).

The overall findings suggest that the higher the payout ratio, the less volatile a stock price will be. They also suggest that payout ratio is the main determinant of the volatility of stock price. Among the control variables, it is discovered that size and age have significant negative relationship with price volatility, suggesting that the larger and mature the firm, the less volatile the stock price is, debt, on the other hand, showed a significant positive relationship with price volatility, suggesting that the more leveraged a firm is, the more volatile the stock price will be. Since both management and investors are concerned about the volatility of stock price, this research has provided a light on the pathway to discovering what moves stock price, as well as important factors to be considered by investors before making investment decisions and by management in formulating dividend policies for their firms. This research also discussed some theories and determinants of dividend policy, as well as theories of risk and dividends.

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Appendix Summary of Results of Stock Price Volatility

HYPOTHESIS	**RESULTS**	**REFERENCES**
Ha: dividend yield has negative significant impacts on stock price volatility of the Malaysian firms.	**Accepted*** **	*Chen, L., Da, Z. and Zhao (2013)*
Hb: dividend payout has negative significant impacts on stock price volatility of the Malaysian firms.	**Accepted*** **	*Hussainey et. al (2011)*
Control variables		
HYPOTHESIS	**RESULTS**	***REFERENCES***
Hc: firm's size positively affects stock price volatility of the Malaysian firms.	**Rejected*** **	*Hussainey, and Walker (2009).*
Hd: Earning volatility positively affects price volatility of Malaysian firms.	**Rejected**	*Kenyoru, Kundu, and Kibiwott (2013).*
He: long term debt positively affects price volatility of Malaysian firms.	**Accepted*** **	*Laopodis (2008)*
Hf: Firm's growth negatively affects price volatility of Malaysian firms.	**Accepted****	*Kenyoru, Kundu, and Kibiwott, (2013).*
Significant at 1%=***, 5%=** and 10%=*		