

Determinants of Stock Price Volatility in Karachi Stock Exchange: The Mediating Role of Corporate Dividend Policy

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Abstract

Corporate dividend policy has been remained a heavily investigated issue in corporate finance. After the work of Nobel Laureate Modigliani and Miller (1958), much has been written on the dividend policy of the firms. The present paper is also an attempt in this regard to investigate the role of corporate dividend policy in determining the volatility in the stock prices in Pakistan. A sample of 73 firms has been selected from Karachi Stock Exchange (KSE) indexed (KSE-100) firms for the period of 2003-2008 and fixed effect and random effect models have been applied on the panel data. The results found that dividend policy has a strong significant relationship with the stock price volatility in KSE. The findings are consistent with the earlier researchers of developing economies that price volatility may be reduced by employing an effect corporate dividend policy (Rashid and Rahman, 2008).

Keywords: Price volatility, dividend yield, earning volatility, dividend policy, determinants, , payout ratio, Pakistan.

JEL Classification Codes: G10, G14, G32, G35

1. Introduction

Having a number of studies, there is still a contradiction about the relationship between dividend payouts and stock price volatility, and this topic is yet open for discussion and investigation. This discussion was firstly initiated by Modigilani and Miller (1958). According to MM firm's value is irrelevant to dividend policy and firm's stock price volatility is solely based upon its earning ability. Bhattacharya (1979), John and Williams (1987) and Miller and Rock (1985) reported that above statement could be only true if shareholders have symmetric information about the company's financial position but normally managers pass positive information to the shareholders by retaining any negative information until any regulation or financial constraint force them to disclose that information.

Cash flow/ Overinvestment hypothesis of Jensen (1986) provided us another view of this topic, where according to Jensen there is a positive relationship between dividend and stock price reactions. He states that managers tend to hold cash to invest in negative NPV projects for their own utility maximization. The agency cost that results from this overinvestment reduces the value of the firm. Dividend signaling hypothesis also defines the positive relationship between the direction of dividend and price of stock of the firm. And according to Free Cash Flow (FCF) hypothesis, there is a positive relationship among the dividend policy of a firm and its stock prices but we must consider the growth opportunities that the firm is facing. It means if a firm pays fewer dividends it would have more funds to invest in projects with less PV and it would cause devaluation of stock prices of the firm, but remember a firm having better opportunities for growth will better utilize these funds. So a firm having less growth opportunities would face more stock price volatility as compared to the firms having many opportunities to grow.

Different researchers have different views about the relationship among dividend policy and stock prices. The earlier work on dividend-yield and stock price-volatility was conducted by Harkavy (1953); Friend and Puckett, (1964); Litzenberger and Ramaswamy (1982); Fama and French (1988); Baskin (1989) and Ohlson (1995) in the context of United States. Rozeff (1982) found a high correlation between value line CAPM and betas and dividend payout for 1000 US firms. Fama (1991) and Fama and French (1992) focus on dividends and other cash flow variables such as accounting earnings, investment, industrial production etc to explain stock returns. Allen and Rachim (1996) in Australia found no significant relationship between dividend policy and stock prices. Gordon (1963) argues that stock prices influenced by dividend payouts. He reported that firm with large dividends faces less risk in terms of stock price volatility. Some of hypothetical mechanisms suggest there is a universal relationship of dividend yield and dividend payout ratio with stock price volatility. Jensen's and Meckling developed an agency cost argument in (1976), which suggests that dividend payouts reduce the cost of funds and increase the cash flows of the firm. The company after paying cash dividends to stock holders would have less idle funds in the hands of managers to invest in less or negative NPV projects.

According to Miller and Rock (1985); Asquith and Mullin (1983); Born et al. (1984), when a company declares dividends, it provides information to its shareholders to forecast the financial position and the earning ability of the company. But these forecasts also depend upon the source of information whether it is reliable or not. Still there is disagreement among different researchers on the relationship of dividend yield and stock price volatility and it is still unexplained and is considered as debatable in corporate finance. Friend and Puckett (1964) initiated the work on relationship between dividend and stock price volatility. They found a positive relationship among dividend and stock prices. Ball et. al. (1979) found a positive impact of dividend yield on post announcement rate of returns. Michaely (1991) states that long-term individual investors do not affect the ex-day stock prices infact ex-day stock prices strongly affected by the short-term individual investors and corporate traders. Baskin (1989) argues that there is significant, dominating negative relationship between dividend and stock price volatility.

Contrarily Allen and Rachim (1996) found a significant positive correlation among stock price volatility and earning volatility and leverage, and a significant negative relationship between price volatility and payout ratio. Conroy et al. (2000) found that current dividend announcements are unable to explain the market reaction towards announcements. Nishat and Irfan (2001) argued that both dividend payout ratio and dividend yield have significant affect on stock price volatility. Rashid and Rehman (2008) found a positive but non-significant relationship among stock price volatility and dividend yield in the stock market of Dhaka. Some other studies on stock price volatility in Pakistan include Nishat and Bilgrami (1994) and Nishat (1999).

Lot of work has been done so far on this topic, but almost all the studies have took dividend yield as a measure of dividend policy and as independent variable to find how it affects the stock prices, but the study on relationship of Dividend payout and price volatility in emerging market is found absent. This study also seeks to examine the effect of dividend policy considering dividend yield

and payout as independent variables, on the stock price volatility in emerging markets by taking Pakistan as a case and by taking the data of firms listed in Krachi Stock Exchange for examination. The remainder of the paper is organized as follows: section 2 discusses the theoretical framework and variables followed by results and discussions in section 3 and conclusion in section 4.

2. Theoretical Framework

2.1. Study Variables

Stock price volatility is generally related with long term debt ratio, earning volatility, asset growth, size and dividend policy. Market risk is another factor that can influence the dividend policy of the firm. That's why we have taken the controlled variables to find out the real relationship between our dependent variable price volatility and independent variable dividend yield. As due to operating risk, there is a possibility of direct link between price volatility and leverage. Small firms that are not supposed to be highly diversified in their operations, so financial institutions and investors are also less interested in these types of firms and they are less interested in the analysis of stocks of these small firms. This could cause stocks of small firms less informed in the market and more illiquid. It leads to greater price volatility of their stocks. According to the Baskin (1989) "firms with a more dispersed body of shareholders may be more disposed towards using dividend policy as a signaling device". So we have taken the Size as a control variable.

The dividend payout policy also expected to be negatively related to investment opportunities. The earlier mentioned rate of return effect is supposed to create timing differentials in the underlying cash flow of the company. We have included a variable to see the growth in assets, because it is quite possible that any other relation between dividend policy and stock price volatility could be occur. So we added Assets Growth as a control variable. It can be another possible situation that regular changes in market conditions, cost formulations etc., may cause to make changes and differences in dividend policy. These all factors or variables have also link with price volatility. So we need to add control variables for these situations. We have seen there could be a relationship among loans and dividend policy, so we constructed a control variable to represent company's leverage.

2.2. Measurement of Study Variables

Price Volatility (PV)

We use Price volatility as a dependent variable, which is usually calculated by taking highest value and lowest value estimate or by calculating the square of the standard deviation of the stock prices. In our research we calculate PV of every year by taking the annually rang (difference between minimum and maximum values) of every stock price, dividing it by the averages of low and high prices and by taking the square (second power) of it.

Dividend Yield (DY)

This variable is calculated by taking the sum of all cash dividends that are paid by the companies to their stock holder per share divided by the mean market vale of stock in the year.

Payout Ratio (POR)

Payout ratio is calculated by dividing the total dividend to total earning of every stock. We have calculated cumulative earning and dividends of each company individually for every year in order to control the problem of extreme values in individual year that lead the results to low or negative net income.

Leverage

It is the ratio of company's long term debt (excluding the liabilities which are due within one year) to total assets.

Assets Growth (ASg)

This control variable is designed by taking the ratio of change in total assets of a firm per annum.

Earnings Volatility (EV)

It is the standard deviation of the ratio of company's operating earnings before interest and tax (EBIT) to total assets.

Size (SZ)

This variable has been calculated by constructing the average value of common stock. The size of the company explains the real magnitude of the company.

2.3. Sample Description & Data

Our sample includes firms of KSE-100 index with non-missing observations for the whole data (that was required to calculate our concerned variables) between 2003 and 2008 and for this purpose 73 companies are selected as we didn't get related information about remaining companies. Most of rejected companies are from banking sector. Some of those companies were de-listed during our observed time period; some companies were merged in other companies. Furthermore, some companies got registered during our observed period. The panel data is used for the whole period containing 438 year end observations for each variable. The annual data of these firms in the sample is collected through various sources i.e. "Balance Sheet Analysis" (1998-2002) and (2003-2008) published by "State Bank of Pakistan" and, companies' annual reports. The yearly stock price data is collected from Business Recorder's and KSE's website. The data related to banking, investment and insurance sector is collected through annual reports of companies and analysis reports of KSE.

2.4. Model

The analysis utilized fixed effect and random effect regression model; the test involved regressing the dependant variable PV and independent variable dividend yield. Following regression was used as base to show the relationship of dividend policy with stock price volatility.

$$PV_j = a_1 + a_2DY_j + a_3POR_j + e_j$$

Baskin (1989) stated that there is significant, dominating and negative relationship between dividend yield and stock price volatility. According to the above mentioned model only two variables of dividend policy can affect price volatility but there are number of other factors which also affect both price volatility and dividend policy. So we have constructed a modified regression model including all control variables in order to limit the influence of these variables.

$$PV_j = a_1 + a_2DY_j + a_3POR_j + a_4SZ_j + a_5EV_j + a_6LVRG_j + a_7AG_j + e_j$$

Here, we have used fixed model effect and Random effect model of regression to show the clear relationship of the price volatility with dividend yield and payout ratio. Previous studies have reported that these all controlled variables have impact on dividend policy and price volatility. Such as according to Nishat and Irfan (2001) the size, leverage and earning volatility has significant impact on stock price volatility.

3. Results and Discussion

Table 1 summarizes the descriptive details for seven variables affecting price volatility of stocks traded in KSE. Price volatility ranges from 0.01 to 3.54 with mean value equal to 0.59 and standard deviation measuring 0.57. Second variable of investigation is dividend yield. It ranges from 0 to 0.90; whereas

mean value for dividend yield is 0.043 and standard deviation is 0.081. Earnings volatility is third variable that determines the changes in stock prices. Our data represents that minimum value for this variable is -0.324 and maximum value is 3.639. Table 1 also represents the mean value for earning volatility to be 0.184 and standard deviation to be 0.281.

In our model payout ratio is fourth variable that affects price volatility of stocks traded in KSE. Payout ratio ranges from minimum of -10.26 to a maximum of 8.093. Mean value of the variable equals 0.362 with standard deviation 0.864. Leverage is fifth explanatory variable affecting price volatility. The values of leverage range from 0 to 219.95, having mean value equal to 0.594 (highest among all variables) and standard deviation equaling 10.50. Leverage has highest value for standard deviation. Next independent variable is line is assets growth. Table 1 show that the values for assets growth range from -0.912 to 17.44 with mean value of 0.415 and standard deviation equaling 1.452. Last variable in the proposed regression model is Firm Size. The measure for this variable ranges from 18.51 to 26.54, having mean value of 22.91 and standard deviation of 1.451.

Table 2 shows the correlation matrix of variables table suggests that a significant negative correlation which is also significant is exist between price volatility and dividend yield which is -0.101(1-tail test significant at 0.01) which is less than Nishat and Irfan (2001) results which was -0.218. which means the firms having high dividend yield will have low price volatility and there is also negative and significant relationship between payout ratio and stock price volatility which is -0.138 (significant at 0.01) which means the firms who pay more dividends have less stock price variations i.e. the firms with high payout ratio tend to be less risky in terms of stock prices.

Table 1: Descriptive Statistics

Variables	Min.	Max.	Mean	S.D.	Skewness		Kurtosis	
					Statistic	Std. Error	Statistic	Std. Error
Price Volatility	0.0100	3.54	0.591553	0.572216	2.031	0.117	5.462	0.233
Dividend Yield	0.0000	0.9032	0.043969	0.081177	6.586	0.117	56.511	0.233
Earnings Volatility	-0.3245	3.6390	0.184806	0.281833	6.742	0.117	65.996	0.233
Payout Ratio	-10.26	8.0936	0.362675	0.864119	-1.647	0.117	69.816	0.233
Leverage	0.0000	219.9543	0.59426	10.507	20.915	0.117	437.631	0.233
Assets Growth	-0.9126	17.4423	0.415778	1.452490	8.210	0.117	75.895	0.233
Firm Size	18.515	26.5494	22.9161	1.451109	-0.439	0.117	0.300	0.233

Table 2 represents results for correlations among explanatory variables affecting price volatility. Table 2 shows that values for price volatility correlate negatively with both dividend yield (-0.101) and payout ratio (-0.138) at 99% level of significance which is almost same as Nishat and Irfan (2001) indicating which means that higher dividend paying firm, has lower price volatility. Price volatility has positive non-significant correlation with both earnings volatility (0.005) and firm size (0.008). There exists a non-significant negative correlation between measures of price volatility and asset growth (-0.025). A low positive relationship exists between price volatility and leverage (0.060), the value however is significant at 90% level of confidence showing firms who have high dividend yield would have more debts.

Table 2: Correlation Matrix

Variables	Price Vol.	Div. Yield	Earning Volatility	Payout Ratio	Size	Leverage
Dividend Yield	-0.101***					
Earnings Volatility	.005	0.088**				
Payout Ratio	-0.138***	0.561***	0.068*			
Leverage	0.060*	-0.062*	0.007	0.013		
Assets Growth	-0.025	0.117***	-0.025	0.022	-0.027	
Firm Size	0.008	-0.057	-0.049	-0.041	-0.036	-0.008

*, **, and *** are significant at the 10%, 5%, and 1% levels, respectively

Second variable is regression equation is Dividend Yield. Dividend yield has significant positive correlation with earnings volatility (0.088), payout ratio (0.561), and assets growth (0.117). Dividend yield correlates negatively with leverage (-0.062) and firm size (-0.057); however correlation with firm size is not significant. Earnings volatility is third variable and has positive significant correlation with payout ratio (0.068) at 90% level of confidence. Earning volatility correlates negatively with both Assets Growth (-0.025) and Firm Size (-0.049), however the relationship is non-significant. There is weak positive correlation between leverage and earning volatility (0.007), the relationship is however, non-significant. Payout ratio has weak correlations with leverage (0.013), assets growth (0.022) and firm size (-0.041). Payout ratio has positive correlation with both leverage and assets growth whereas it correlates negatively with firm size. None of these correlations is significant.

Earning Volatility and dividend yield shows that companies with volatile earnings pay high dividends as in our analysis many companies in the years of loss also pays dividend many time. Size variable has negative correlation with dividend yield and positive correlation with price volatility which means that larger firms will have more investment opportunities as compared to small ones so they pay fewer dividends to the stockholders. Due to heavy investments made by firm, new investors make more investments in the company which leads to more price volatility.

Table 3: Fixed Effect Model: Dependent Variable: Price Volatility

Variable	Coefficient	Std. Error	t-value	Prob.
Dividend Yield	0.467756	0.393897	2.187508	0.0358
Payout Ratio	-0.067326	0.032919	-2.045185	0.0416
SIZE	0.141439	0.050373	2.807855	0.0053
Earning Volatility	0.166427	0.092949	1.790528	0.0742
Leverage	-0.002208	0.002259	-0.977551	0.3290
Growth	-0.006154	0.016218	-0.379426	0.7046
Effects Specification				
Cross-section fixed (dummy variables)				
Period fixed (dummy variables)				
R-squared	0.503241	Mean dependent var	0.591231	
Adjusted R-squared	0.386769	S.D. dependent var	0.572290	
S.E. of regression	0.448155	F-statistic	4.320717	
Sum squared resid	71.09830	Prob. (F-statistic)	0.000000	
Durbin-Watson stat	1.946807			

In order to validate our correlation results, we have applied the fixed effect and random effect models and results have been reported in Table 3 and 4, respectively. In our regression model we have taken dividend payout ratio and dividend yield as independent variables by taking data from 2003 to 2008. Results are presented in Table 3 (fix-effect model) and Table 4 (random effect model). Fix effect model has more significant results between both dividend yield and payout ratio. We have estimated the regression along with some control variables namely earning volatility, size, and leverage and asset growth to find that either the correlations are weekend by adding these control variables or not. It can be easily interpreted from the given values in the tables that results of the both the models are somewhat similar in terms of directions of the relationship, however, varying with respect to the level of significance. Stock prices of KSE-100 indexed firms are more affected positively from dividend yield of the stocks, size of the firm, variations in the net earning of firms whereas, corporate payout ratio, leverage and assets growth are negatively leading stock prices of the sample firms. Use of more debts in business and more assets are not perceived by the investors as a positive sign of performance.

Table 4: Random Fixed Effect Model: Dependent Variable: Price Volatility

Variable	Coefficient	Std. Error	t-value	Prob.
Dividend Yield	0.093150	0.369394	0.252170	0.8010
Payout Ratio	-0.064995	0.032110	-2.024138	0.0436
SIZE	0.032197	0.027074	1.189235	0.2350
Earning Volatility	0.145354	0.087209	1.666721	0.0963
Leverage	-0.001896	0.002199	-0.862195	0.3891
Growth	-0.000934	0.015749	-0.059329	0.9527
Effects Specification				
Cross-section fixed (dummy variables)				
Period fixed (dummy variables)				
R-squared	0.286908	Mean dependent var	0.591231	
Adjusted R-squared	0.268495	S.D. dependent var	0.514980	
S.E. of regression	0.440453	F-statistic	15.58170	
Sum squared resid	82.64337	Prob. (F-statistic)	0.000000	
Durbin-Watson stat	1.684414			

4. Summary and Conclusion

We have conducted this research to investigate the affect of corporate payout policy on stock price volatility. A sample of 73 firms from KSE is inspected for the period of six years from 2003-2008. The experiential estimation is based upon a fix effect and random effect model regression analysis between the dividend policy and stock price volatility along with control variables of size, leverage, growth and earning. We found both the dividend policy measures (dividend yield and payout ratio) have a significant impact on the share price volatility. This suggests that dividend policy affects stock price volatility and it provides verification supporting the arbitrage realization effects, duration effect and information effect in Pakistan. The effect of the dividend yield to stock price volatility increased during the whole period (2003-2008) whereas payout ratio has only a significant impact at lower level of significance. In overall period, the size and leverage have negative and non-significant impact on stock price volatility. Although the results are not strong enough as in the case of developed markets but are reliable with the behavior of emerging stock markets like Pakistan.

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