Dividend policy and stock price volatility: A case of the Zimbabwe stock exchange

Petros Jecheche
University of Zimbabwe

ABSTRACT

This paper attempts to determine the impact of dividend policy on stock price risk in Zimbabwe. A sample of 60 listed companies in Zimbabwe Stock Exchange is examined for a period from 2001 to 2011. The empirical estimation is based on a cross-sectional regression analysis of the relationship between stock price volatility and dividend policy after controlling for firm size, earning volatility, leverage and asset growth. Both dividend policy measures (dividend yield and payout ratio) have significant impact on the share price volatility. The relationship is not reduced much even after controlling for the above mentioned factors. This suggests that dividend policy affects stock price volatility and it provides evidence supporting the arbitrage realization effect, duration effect and information effect in Zimbabwe. The responsiveness of the dividend yield to stock price volatility increased during Multiple Currency Regime (2009-2011). In overall period the size and leverage have positive and significant impact on stock price volatility. The size effect is negative during pre Multiple Currency period (2001-2008) but positive during Multiple Currency period. The earning volatility impact is negative and significant only during the Multiple Currency period. Although the results are not robust enough as in the case of developed markets they are consistent with the behaviour of emerging markets.

Keywords: share price volatility, Valuation theories

INTRODUCTION

Dividend policy remains a source of controversy despite years of theoretical and empirical research, including one aspect of dividend policy: the linkage between dividend policy and stock price risk (Allen and Rachim, 1996). Paying large dividends reduces risk and thus influence stock price (Gordon, 1963) and is a proxy for the future earnings (Baskin, 1989). A number of theoretical mechanisms have been suggested that cause dividend yield and payout ratios to vary inversely with common stock volatility. These are duration effect, rate of return effect, arbitrage pricing effect and information effect.

Duration effect implies that high dividend yield provides more near term cash flow. If dividend policy is stable, high dividend stocks will have a shorter duration. Gordon Growth Model can be used to predict that high-dividend will be less sensitive to fluctuations in discount rates and thus ought to display lower price volatility.

Agency cost argument, as developed by Jensen and Meckling (1976) proposed that dividend payments reduce costs and increase cash flow, that is payment of dividends motivates managers to disgorge cash rather than investing at below the cost of capital or wasting it on organizational inefficiencies (Rozeff, 1982 and Easterbrook 1984). Some authors have stressed the importance of information content of dividend (Asquith and Mullin, 1983; Born, Moser and officer 1983). Miller and Rock (1985) suggested that dividend announcements provide the missing pieces of information about the firm and allows the market to estimate the firm's current earnings. Investors may have greater confidence that reported earnings reflect economic profits when announcements are accompanied by ample dividends. If investors are more certain in their opinions, they may react less to questionable sources of information and their expectation of value may be insulated from irrational influence.

Rate of return effect, as discussed by Gordon (1963), is that a firm with low payout and low dividend yield may tend to be valued more in terms of future investment opportunities (Donaldson, 1961). Consequently, its stock price may be more sensitive to changing estimates of rates of return over distant time periods. Thus expanding firms although may have lower payout ratio and dividend yield, exhibit price stability. This may be because dividend yields and payout ratio serves as proxies for the amount of projected growth opportunities. If forecasts of profits from growth opportunities are less reliable than forecasts of returns on assets in place, firms with low payout and low dividend yield may have greater price volatility. According to duration effect and arbitrage effect, the dividend yield and not the payout ratio is the relevant measure. The rate of return effect implies that both dividend yield and payout ratio matters. Dividend policy may serve as a proxy for growth and investment opportunities. Both the duration effect and the rate of return effect assume differentials in the timing of the underlying cash flow of the business. If the relationship between risk and dividend policy remains after controlling for growth, this would suggest evidence of either the arbitrage or information effect.

Empirical studies have examined cross-sectional variation in dividend payout ratios and Capital Asset Pricing Model (CAPM) beta coefficients. Beaver *et. al.* (1970) estimated CAPM betas for 307 US firms and obtained significant correlation between beta and dividend payout. 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. Baskin (1989) takes a slightly different approach and examines the influence of dividend policy on stock price volatility, as opposed to returns. The difficulty in any empirical work examining the linkage between dividend policy and stock volatility or returns lies in the setting up of adequate controls for the other factors. For example, the accounting system generates information on several relationships that are considered by many to be measures of risk. Baskin (1989) suggests the use of the following control variables in testing the significance of the relationship between dividend yield and price volatility: operating earnings, size of the firm, level of debt financing, payout ratio and level of growth. These variables have a clear impact on stock returns but also impact on dividend yield.

Zimbabwe Stock Exchange (ZSE) is an important emerging market of the region among the developing countries. ZSE is termed as high-risk high return market where investors seek high-risk premium (Nishat, 1999). Few studies have attempted to analyse the long run behaviour of the market and related issues (Nishat, 1991, 1992 1995, 1999, 2001; Nishat and Bilgrami, 1994) but no work has been done to explore role of dividend yield and payout ratio in affecting the share prices. It is also important to study its role in the Zimbabwe context after the introduction of the Multiple Currency system in 2009. The objective of this study is to find the role of dividend policy measures i.e. dividend yield and payout ratio on share price changes in the long run. It also attempts to assess the pattern of relationship before the introduction of the Multiple Currency system and after its introduction

The rest of the paper is organized such that the theoretical frame work and model specification is presented in section two. The data and variable description is provided in section three followed by results discussed in section four. The summary and concluding remarks are in section five.

THEORETICAL FRAMEWORK AND MODEL SPECIFICATION

Control variables

Share price volatility should be related to the basic risks encountered in the firm's product markets. Market risk may also have impact on the firm's dividend policy. Therefore a control variable is included to account for the variability in the firm's earnings stream. Given operating risk, there should be a direct link between stock price volatility and leverage. Under conditions of asymmetric information there is also likely to be a link between borrowing and dividend policy. A control variable was included to reflect corporate leverage. There are potential links between size and volatility. Small firms are likely to be less diversified in their activities and less subject to investor scrutiny. Institutions appear to concentrate their research activities and investment policies on larger listed companies. The market in the stocks of small listed firms could conceivably be less informed, more illiquid, and as a consequence subject to greater price volatility. Baskin (1989) suggests that firms with a more dispersed body of shareholders may be more disposed towards using dividend policy as a signaling device. The latter may also be a function of size and thus a size control was required.

Dividend payout policy could be inversely linked to growth and investment opportunities. The previously mentioned duration and rate of return effects assume timing differentials in the firm's underlying cash flows. A variable to reflect growth was also included. The suggestion is that any remaining link between dividend policy and stock price volatility, after controlling for the influence of growth, would be suggestive of either the arbitrage or information effect. It is also possible that systematic differences in market conditions, cost structures, regulatory restrictions etc., may lead to differences in dividend policy. These also have impact on price volatility.

Variable definition

Price volatility (PV)

The dependent variable in the regression is derived by following the Parkinson's (1980) extreme value estimate or estimating variance of the rate of return. In this case, for each year, the annual range of stock prices will be divided by the average of the high and low stock prices and then raised to the second power. These average measures of variance for all available years can be transformed to a standard deviation by using a square root transformation. Parkinson (1980) describes how this method is far superior to the traditional method of estimation, which uses closing and opening prices only.

Dividend yield (DY)

The variable was calculated by summing all the annual cash dividends paid to common stock holders and then dividing this sum by the average market value of the stock in the year. The average for all available years was utilized.

Earning volatility (EV)

In order to develop this variable, the first step is to obtain an average of available years of the ratio of operating earnings (before taxes and interest) to total assets. The next step is to calculate an average of the squared deviation from the overall average. A square root transformation is then applied to the mean squared deviation to obtain estimates of standard deviation.

Payout Ratio (POR)

To begin, total cumulative individual company earnings and dividends were calculated for all years. Payout is the ratio of total dividends to total earnings. The use of this procedure controls the problem of extreme values in individual years attributable to low or possibly negative net income. The payout ratio is set to one in cases where a total dividend exceeds total cumulative profits.

Size (SZ)

The variable size was constructed in a form that reflects the order of magnitude in real terms. The variable was constructed by taking the average market value of common stocks. The value of real size (US$ million) was averaged over the period

Long-term Debt (DA)

The ratio of the sum of all the long-term debt (debt with maturity more than a year) to total assets is taken. An average is taken over all available years.

Growth in Assets (ASg)

The yearly growth rate was calculated by taking the ratio of the change in total assets in a year. Then the ratio was averaged over the years.

Methodology

Summary statistics for the variables were calculated and are reported in table 1 below. The analysis utilized cross-sectional generalized least squares regression. The most basic test involved regressing the dependent variable PV against the two independent variables DY and POR. This provided a crude test of the relationship between common stock volatility and dividend policy. The following regression was adopted:

$$PV_j = a_1 + a_2 DY_j + a_3 POR_j + e_j \quad (1)$$

Table 1 - Descriptive statistics

Variable	Mean	Std. Deviation
PV	0.4979	0.1467
DY	0.0404	0.0319
POR	0.2653	0.3038
EV	0.1019	0.1407
SZ	2.5967	3.0444
DA	0.1524	0.3195
ASg	0.1936	0.9591

Where

PV: Price volatility
POR: Payout ratio
DY: Dividend yield
LSZ: Log Size
ASg: Asset growth
EV: Earning volatility
DA: Leverage

Baskin (1989) reported a significant negative relationship between both the variables above and price volatility. The difficulty with the specification above is that the two dividend policy variables are likely to be related plus a number of other factors are likely to influence both dividend policy and price volatility.

In an attempt to limit these problems the regression was modified to include the control variables as shown below:

The expectation was that the DY, POR and SZ variables would be negatively related to PV whilst EV and DA would be positively related to PV. That is, increases in

$$PV_j = a_1 + a_2 DY_j + a_3 POR_j + a_4 SZ_j + a_5 EV_j + a_6 DA_j + e_j \qquad (2)$$

dividend yield, payout ratio and size of the firm will be associated with a decrease in the volatility of the firm's stock price. By contrast, firms with relatively higher earnings volatility or higher leverage will tend to display higher price volatility.

DATA

All the firms that are continuously listed on the Zimbabwe Stock Exchange from 2001 to 2011 have been taken for the purpose. The annual data of these firms is taken from the various issues of "Balance Sheet Analysis" published by the Zimbabwe Stock Exchange. Price data has been taken from the annual reports and other annual publications of Zimbabwe Stock Exchange.

RESULTS AND DISCUSSION

A broad description of the characteristics of the variables used in the study is given in table 1. If stock prices follow a normal distribution, the standard deviation of stock market returns equivalent to our measured volatility can be estimated. This is done by multiplying the mean volatility of 0.498 by the constant derived by Parkinson (1980). The result is a 29.91 per cent standard deviation that is almost same as reported by Allen and Rachim (1996) for Australian market. Multiple Currency era or second decade standard deviation of 32.56 per cent is more close to Baskin's results of 36.9 per cent for US market.

Table 2 reports the correlation between the variables utilized for the overall period (2001-2011). The correlation between price volatility and dividend yield is –0.218, which is significant at 0.01, which is lower as compared to Baskin results of –0.643. The

correlation between price volatility and payout ratio is –0.177, significant at 0.05 and is also less than that of developed markets. The highest correlation is between payout ratio and dividend yield that has a value of 0.555 and is highly significant. This causes us to modify our regression equation because multicollinearity between two dividend policy measures may be a potential problem. The second highest correlation is between earning volatility and leverage (positive and significant), which means that higher debt firms, has higher earning volatility. Third highest correlation is between asset growth and leverage (positive and significant) i.e. firms with high debt have a high growth rate that clearly means that firms use debt to increase their size.

Table 2 - Correlations

	PV	PY	POR	LSIZE	ASg	EV
DY	-0.218**					
POR	-0.177**	0.555				
LSZ	0.034	0.406	0.336**			
ASg	0.044	-0.083	-0.056	-0.086		
EV	-0.058	-0.257**	-0.025	-0.273**	0.027	
DA	0.047	-0.198*	-0.165*	-0.173*	0.303**	0.324**

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

Where

PV: Price volatility
POR: Payout ratio
DY: Dividend yield
LSZ: Log size
ASg: Asset growth
EV: Earning volatility
DA: Leverage

Significant negative correlation between dividend yield and earning volatility confirms our expectations that companies with volatile earnings are expected to pay lower dividends and to be regarded as more risky. The correlation between dividend yield (and payout ratio) and leverage are negative and significant which implies that with higher levels of debt firms pay lower dividends (and has low pay out ratio). Significant positive correlation between payout ratio and size shows that larger firms pay more of their earnings as compared to smaller ones. Things are somewhat different when the period 2001-2011 is split into two-sub periods, pre Multiple Currency (2001-2008) and Multiple Currency era (2009-2011). In pre Multiple Currency period (2001-2008) there is negative correlation between price volatility and dividend yield, payout ratio, size are

consistent with theory i.e. larger firms and the firms that have higher dividend yield and pay out ratio have lower volatility in their prices, while firms with higher debt have higher volatility in prices. Size variable has opposite sign in the Multiple Currency period than predicted by theory.

The results estimated from equation having dividend yield and payout ratio as independent variables for overall period (2001-2011) are presented in table 3. Both dividend yield and payout ratio are significant. In pre Multiple Currency period both are significant but the coefficient of dividend yield (-0.75) is much greater than that of payout ratio (-0.06). However, in the Multiple Currency period payout ratio is less significant along with very small coefficient compared to that of dividend yield. This is exactly as hypothesized and according to case of developed markets results.

Table 3 - Estimated relation between share prices and dividend policy variables

$$PV_j = a_1 + a_2 DY_j + a_3 POR_j$$

Overall Period (2001-2011)				
Variables	Coefficient	Beta	T-Value	Sig.
DY	-0.735	-0.181	-2.360	0.019
POR	-0.112	-0.337	-4.386	0.000
R^2 = 0.189; Adj. R^2 = 0.1788				
F = 18.203; Signif F = 0.000				

Pre Multiple Currency Period (2001-2008)				
Variables	Coefficient	Beta	T-Value	Sig.
DY	-0.749	-0.330	-4.722	0.000
POR	-0.062	-0.333	-4.763	0.000
R^2 = 0.237; Adj. R^2 = 0.227				
F = 24.436 Signif F = 0.000				

Multiple Currency Period (2009-2011)				
Variables	Coefficient	Beta	T-Value	Sig.
DY	-2.608	-0.387	-4.445	0.000
POR	-0.085	-0.049	-1.700	0.091
R^2 = 0.2395; Adj. R^2 = 0.2298				
F=24.572; Signif F = 0.000				

Where

PV: Price volatility
POR: Payout ratio
DY: Dividend yield

We also estimate the regression along with four control variables namely earning volatility, size, leverage and asset growth to determine whether these correlations are weakened by the addition of these variables statistically. Results of the regression are reported in table 4. These show that three factors size, debt and asset growth are significant and increased the explaining power of the model. Two main variables dividend yield and payout ratio has remained significant and explained the larger portion of variation. The positive relation of earning volatility and leverage is according to the expectations but positive relation of size with price volatility is against the theory with small coefficient.

Table 4

Overall Period (2001-2011)

Variables	Coefficient	Beta	T-Value	Sig.
DY	-0.937	-0.231	-2.985	0.003
POR	-0.088	-0.265	-3.350	0.001
EV	-0.082	-0.043	-0.598	0.551
SZ	0.001	0.219	2.971	0.003
DA	0.183	0.191	2.547	0.011
Asg	0.058	0.073	1.009	0.314
Constant	0.554		21.132	0.000

R^2 = 0.2844; Adj. R^2 = 0.2562
F=10.0715; Signif F = 0.000

Pre Multiple Currency Period (2001-2008)

Variables	Coefficient	Beta	T-Value	Sig.
DY	-0.968	-0.427	-6.076	0.000
POR	-0.068	-0.370	-5.994	0.000
EV	0.310	0.075	1.138	0.256
SZ	-0.001	-0.474	-6.794	0.000
DA	-0.008	-0.009	-0.128	0.898
Asg	-0.001	-0.001	-0.015	0.987
Constant	0.498		25.090	0.000

R^2 = 0.471; Adjusted R^2 = 0.450
F = 22.711; Signif F= 0.000

Multiple Currency Period (2009-2011)

Variables	Coefficient	Beta	T-Value	Sig.

DY	-1.702	-0.252	-3.069	0.002
POR	-0.157	-0.274	-3.284	0.001
EV	-0.711	-0.128	-2.033	0.043
SZ	0.001	0.375	5.371	0.000
DA	0.124	0.083	1.222	0.223
Asg	0.042	0.053	0.802	0.424
Constant	0.715		27.508	0.000
R^2 = 0.403; Adjusted R^2 = 0.379				
F = 17.115; Signif F= 0.000				

Where

PV:	Price volatility	EV:	Earning volatility	ASg:	Asset growth.
POR:	Payout ratio	SZ:	Size		
DY:	Dividend yield	DA:	Leverage		

To avoid the multicollinearity that may be present in the model because of use of both dividend yield and payout ratio simultaneously. The payout ratio is dropped and run the regression with control variables. The results are presented in table 5. It indicates that there is a significant negative relationship between dividend yield and price volatility as hypothesized. The significant positive relationship between price volatility and size and debt remains the same. The adjusted R^2 changes a little only while the coefficient of dividend yield improved. These results are similar to one reported by Baskin (1989). He reported that dividend yield had strong negative association with PV, which was twice the magnitude of the influence of any other variable. However, these results are different from Allen and Rachim (1996) who noted payout ratio as the relevant factor for Australian market. Size has a significant positive relation with price volatility that is though against the theory but is a characteristic of Zimbabwe Stock Exchange identified in empirical studies (Nishat, 1999; Irfan and Nishat, 2003). There was significant positive correlation between debt and price volatility but its influence is less than that of dividend yield.

Table 5

$$PV_j = a_1 + a_2 DY_j + a_3 SZ_j + a_4 DA_j + e_j$$

Overall Period (2001-2011)

Variables	Coefficient	Beta	T-Value	Sig.
DY	-1.191	-0.291	-4.049	0.000
SZ	0.001	0.257	3.570	0.000
DA	0.273	0.287	4.002	0.000
Constant	0.523		25.232	0.000
R^2 = 0.226; Adjusted R^2 =0.211				
F = 15.195; Significant F = 0.000				

Pre Multiple Currency Period (2001-2008)

Variables	Coefficient	Beta	T-Value	Sig.
DY	-1.090	-0.480	-7.136	0.000
SZ	-0.001	-0.513	-7.076	0.000
DA	0.097	0.124	1.765	0.079
Constant	0.461		30.336	0.000

R^2 =0.343; Adjusted R^2 =0.330
F=27.163; Significant F= 0.000

Multiple Currency Period (2009-2011)

Variables	Coefficient	Beta	T-Value	Sig.
DY	-2.789	-0.413	-6.100	0.000
EV	-0.791	-0.149	-2.210	0.028
SZ	0.001	0.335	5.072	0.000
DA	0.180	0.119	1.750	0.082
Constant	0.706		27.286	0.000

R^2 =0.361; Adjusted R^2 =0.345
F= 21.952 Significant F= 0.000

Where
PV: Price volatility
DY: Dividend yield
SZ: Size
EV: Earning volatility
DA: Leverage

When dividend yield is dropped and regression is run with payout ratio and the control variables, it indicates a significant impact along with other control factors. This suggests that for the ZSE both these measures are relevant in determining the volatility of common share prices. In the Multiple Currency era, dividend yield has become more important determinant of share price volatility as compared to payout ratio. This shows that the Multiple Currency Regime has improved the market and now companies are paying dividend more and investors are also pricing the shares on this basis.

SUMMARY AND CONCLUSION

The objective of this study is to determine the impact of dividend policy on stock price risk in Zimbabwe. A sample of 60 listed companies in Zimbabwe Stock Exchange is examined for a period from 2001 to 2011. The empirical estimation is based on a cross-sectional regression analysis of the relationship between stock price volatility and dividend policy after controlling for firm size, earning volatility, leverage and asset growth. Both the dividend policy measures (dividend yield and payout ratio) have

significant impact on the share price volatility. The relationship is not reduced much even after controlling for the above mentioned factors. This suggests that dividend policy affects stock price volatility and it provides evidence supporting the arbitrage realization effect, duration effect and information effect in Zimbabwe. The responsiveness of the dividend yield to stock price volatility increased during Multiple Currency period (2009-2011). Whereas payout ratio measure is having significant impact only at lower level of significance. In overall period the size and leverage have positive and significant impact on stock price volatility. The size effect is negative during pre Multiple Currency period (2001-2008) but positive during the Multiple Currency period. The earning volatility impact is negative and significant only during Multiple Currency period. Although the results are not robust enough as in the case of developed markets, they are consistent with the behaviour of emerging markets

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