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Assessment of the Effect of Dividend Volatility on Risk of Stock Returns in Kenyan Listed Firms

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Abstract: **Standard deviation as a measure of dispersion is employed in measuring historical or realized stock return volatility and also measuring absolute risk of stock returns. In this research a sample of 31 stocks listed in the NSE were selected from a population of 56 stocks listed in the NSE during the study period of January 2010 to December 2010. The sample stocks were sorted into three portfolios of stocks exhibiting high, medium and low risk as measured by standard deviation of stock returns. Discounted dividend variables were regressed against standard deviation of stock returns in a multiple regression model for the three portfolios. The findings indicated that the dividend volatility had a significant positive influence on the high risk portfolio and also had a significant negative influence on the low risk portfolio. The findings implied that stock investors in the NSE can assess dividend volatility when stock investments decisions.**

Keywords: **NSE, Historical or Realized Stock Return Volatility.**

1. INTRODUCTION

Risk of Stock Returns:

Standard deviation of stock returns is a classical measure of stock return dispersion and historical stock volatility which measures dispersion from average past stock returns within a period. It is commonly interpreted as absolute or total risk by investors when deciding upon the allocation of financial resources to alternative investments (Shu and Zhang, 2006). Beta on the other hand is a measure of systematic risk or relative risk that focuses on the variance of stock returns relative to stock market returns (Keppler, 1990). Low standard deviation of stock returns can thus be interpreted as low investment risk which may be appealing to risk averse stock investors (Copeland, 2005). The standard deviation is a commonly employed measure of dispersion that utilizes all the data under consideration and summarizes the probability of seeing extreme values. It is a parametric metric that is suitable for data that is normally distributed (Poon and Granger, 2003).

Discounted Dividend Models:

Market generated stock prices should be equal to their intrinsic or fundamental stock values in efficient stock markets (Shiller, 1981). Intrinsic stock prices are derived by discounting dividends using models such as the Gordon’s dividend discount model that comprises of the expected dividends as the numerator while the cost of equity (discounting rate) less the dividend growth rate forms the denominator (Copeland, 2005). The cost of equity is the required rate of return and can be derived from the capital asset pricing model (Fama, 1991).

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2. MOTIVATION OF THE STUDY

Stock investors have the challenge of selecting high return and low risk stocks especially in stock markets that are efficient since the stock prices are expected to arise in a random manner. The NSE being weak form efficient is also expected to exhibit randomness in stock price occurrence (Mlambo and Biekpe, 2010). Randomness of stock prices is then expected to generate high volatility of stock returns as measured by standard deviation. The high volatility of stock returns may be appealing to risk seeking investors who tend associate high risk investments with high investment returns. However risk averse investors tend to prefer reduced randomness of stock prices as it is associated with predictable stock returns which also tend to exhibit low standard deviation (Sill, 1993).

Dividend discounting models variables have been criticized for being dependent on discretionary payout rates. Additional criticism includes the fact that the cost of equity which is derived from capital asset pricing model (CAPM) and hence it assumes the weaknesses of CAPM (Mishkins and Eakins, 2006).

In markets efficient like NSE, the intrinsic stock prices as derived from discounted dividends should be equal to the market prices as yielded from forces of demand and supply (Shiller, 1981). If volatility of discounted dividends possesses significant predictive power over the risk of stock returns, then stock investment decisions in the NSE can also be made based on the movement of the discounted dividends and thus the motivation for this research.

RESEARCH OBJECTIVE:

To assess whether risk of stock returns in the NSE is significantly influenced by the volatility discounted dividends.

3. RESEARCH METHODS

Population and Sample:

Currently there are 62 listed companies in the NSE that are categorized into ten sectors of the economy including: agricultural, automobile and accessories, banking, commercial and services, construction and allied, energy and petroleum, insurance, investment, manufacturing and allied and telecommunication and technology sectors. In the study period between years 2001 to 2010, the NSE had 56 listed companies that formed its population. The current research employed balanced panel data consisting of monthly closing stock price data for the decade of years 2001 to 2010 that was expected to have 120 months for the 31 companies that constituted the sample selected using purposive sampling method. The closing average stock price data was chosen in the current research as it represented the most current valuation of firms before trading continues in the following day.

Data Analysis:

Stock Performance Measure:

The stock performance measured by rate of logarithmic stock return (Copeland, 2005):

$$L_n R_t = L_n (R_t / R_{t-1}) - 1 \quad (1)$$

Where: L_n = natural logarithm

$L_n R_t$ = stock return for current period

R_t = stock return for the current month

R_{t-1}= stock return for the previous month

Measure of Risk of Stock Returns:

In this research, an assumption of historical standard deviation has been made since it places emphasis on ex-post measurement of standard deviation using past stock return data (Andersen *et* al, 2005). The standard deviation of stock returns is modeled as follows (Sweeney, 2006):

$$\sigma_p = \sqrt{} (R_t - \bar{R})^2 / n \quad (2)$$

Where: σ_p = standard deviation of portfolio of stocks

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R_t = return of stock t

$\bar{R}$ = mean stock return

n = number of periods

Discounted Dividends Model:

The numerator of the Gordon's dividend discounting models is expected stock dividend while the denominator is cost of equity less dividend growth rate (Foerster and Sapp, 2005). Cost of equity is derived from the capital asset pricing model as follows (Fama, 1991):

$P_0 = Div_1 / K_e - g$ (3)

$Div_1 = Div_0 (1+g)$ (4)

$K_e = R_f + (ER_m – R_f) \beta_e$ (5)

Where: P_0 = current market price per share

Div_0 = current dividends

Div_1 = expected dividends

K_e = cost of equity

R_f = riskless rate

ER_m = expected market return

β_e = stock beta

The Equilibrium Model:

In this research, the 31 stocks in the sample NSE were initially sorted into three portfolios that consisted of high decile standard deviation stocks, medium decile standard deviation stocks and low decile standard deviation stocks (Blitz and Vliet, 2007). The three portfolios were then regressed using multiple regression analysis against their related Gordon's discounted dividend model variables including dividend per share, cost of equity, and dividend growth rate over the 10 year study period. The multiple regression and equilibrium model was as follows (Sweeney, 2006):

$\sigma_p = \alpha + \beta_1 DPS_1 + \beta_2 K_e + \beta_3 G_r + \varepsilon$ (6)

Where: σ_p = standard deviation of portfolio of stocks

α = constant

β_i = coefficients

DPS = dividend per share

K_e = cost of equity

G_r = growth rates

ε = error term

4. RESULTS

Results on Regression Analysis:

The multi-regression model developed for the high standard deviation stocks portfolio was as follows:

$\sigma_p = 0.233 + 0.014\ DPS + 1.703\ K_e + 0.053\ G_r + \varepsilon$ (7)

(0.00) (0.029) (0.147) (0.191)

$R^2 = 0.656$

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Test results on goodness of fit of the multi-regression model on high risk stocks portfolio indicated that the model is a good fit as measured by the coefficient of determination R^2 of 0.656 as per Table 1. Test on predictive ability of independent variables indicated that dividend per share had significant positive predictive power with a p-value of 0.029 which was lower than the 0.05 level of significance. The other independent variables had poor predictive power as indicated in Table 1. The positive and significant influence that dividend per share had on the high standard deviation of stock returns portfolio implied that the more the dividends that investors receive, the more anxious they become perhaps about maintenance of the high dividend payment by the company and hence the high standard deviation of stock returns.

Table 1: Results on Regression Analysis on High Risk Stocks Portfolio

Model Summary						
Model	**R**	**R Square**	**Adjusted R Square**	Std. Error of the Estimate		
1	**.810**[a]	**.656**	**.484**	.03016		
Coefficients [a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	**p-value**
		B	Std. Error	Beta		
1	(Constant)	.233	.016		14.742	**.000**
	Cost of equity	1.703	1.024	.439	1.664	**.147**
	Dividend per share	**.014**	.005	.740	2.865	**.029**
	Dividend Growth rate	.053	.036	.370	1.474	**.191**
a. Dependent Variable: standard deviation						

The multi-regression model developed for the medium risk stocks portfolio was as follows:

$$\sigma_p = 0.172 + 0.002\ DPS\ - 0.287\ K_e + 0.001\ G_r + \varepsilon \qquad (8)$$

$$(0.00)\quad (0.227)\qquad (0.711)\qquad (0.948)$$

$R^2 = 0.22$

Test results on goodness of fit of the multi-regression model on medium risk stocks portfolio indicated that the model was not a good fit as measured by coefficient of determination R^2 of 0.469 as per Table 2. All the independent variables had poor predictive power as indicated in Table 2.

Table 2: Results on Regression Analysis on Medium Risk Stocks Portfolio

Model Summary						
Model	**R**	**R Square**	**Adjusted R Square**	Std. Error of the Estimate		
1	**.469**[a]	**.220**	**-.115**	.01732		
Coefficients [a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	**p-value**
		B	Std. Error	Beta		
1	(Constant)	.172	.010		17.027	**.000**
	Cost of equity	-.287	.744	-.132	-.386	**.711**
	Dividend per share	.002	.002	.451	1.324	**.227**
	Dividend Growth rate	.001	.012	.023	.067	**.948**
a. Dependent Variable: standard deviation						

The multi-regression model developed for the low risk stocks portfolio was as follows:

$$\sigma_p = 0.131 - 0.003\ DPS - 0.383\ K_e + 0.069\ G_r + \varepsilon \quad (9)$$

(0.00) (0.002) (0.282) (0.212)

$R^2 = 0.872$

Test results on goodness of fit of the multi-regression model on low risk stocks portfolio indicated that the model is a very good fit as measured by coefficient of determination R^2 of 0.872 as per Table 3. Test on predictive ability of independent variables indicated that dividend per share had significant negative predictive power with a p-value of 0.02 which was lower than the 0.05 level of significance. The other independent variables had poor predictive power as indicated in Table 3. The negative and significant influence that dividend per share had on the low risk of stock returns portfolio implied that the more the dividends that investors receive, the less anxious they become. Perhaps they become more assured about maintenance of the high dividend payment by the company and hence the less standard deviation of stock returns.

Table 3: Results on Regression Analysis on Low Risk Stocks Portfolio

Model Summary						
Model	**R**	**R Square**	**Adjusted R Square**	Std. Error of the Estimate		
1	**.934[a]**	**.872**	**.807**	.00804		
Coefficients [a]						
Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	**p-value**
1	(Constant)	.131	.007		19.024	**.000**
	Cost of equity	-.383	.324	-.220	-1.182	**.282**
	Dividend per share	**-.003**	.001	-.812	-5.035	**.002**
	Dividend Growth rate	.069	.050	.275	1.395	**.212**
a. Dependent Variable: standard deviation						

5. DISCUSSION AND CONCLUSION

From the regression results, stock dividends have significant influence on the high and low risk stock portfolios. The results agree with the Gordon's dividend discount model that exhibits a direct relationship between expected dividends and the stock value..

Policy Implications:

Stock investors who intend to make profits in the NSE can study stock dividends in order to predict stock returns and their related dispersion or risk.

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