RELATIONSHIP BETWEEN MACROECONOMIC VARIABLES AND DIVIDEND PAYOUT OF SOME LISTED FIRMS ON THE GHANA STOCK EXCHANGE MARKET: A RANDOM EFFECT ANALYSIS APPROACH

ABSTRACT

Aim: The objective of this study was to assess the impact of macroeconomic variables such as inflation, interest rate, exchange rate and market capitalization on dividend payout for some of firms listed on the Ghana Stock Exchange (GSE).

Method: The study used data spanning from 2014 to 2019 (six years). Three panel regression models namely the pooled OLS, fixed effect and random effect model were run separately and it was found that the random effect model was robust to the data and so the random effect model of panel-data estimation was used in this analysis.

Results: Results from the study reveals that market capitalization (*P=.001*) and inflation (*P=.000*) were statistically significant variables that affect dividend payout, though in different directions; market capitalization affects dividend payout negatively whilst inflation affects dividend payout positively. However interest rate (*P=.23*) and exchange rate (*P=.38*) were found to be statistically insignificant. Also was found that the model was statistically significant.

Conclusion: It was concluded that inflation rate has a positively relationship with dividend payout while market capitalization has a negative relationship with dividend payout to shareholders. However, interest and exchange rates showed no significant relationship with dividend pay-out to shareholders in this study.

Recommendation It will be recommended that policy makers should review the influence of inflation and market capitalization in order to improve on the dividend payout to investors on the GSE.

Keywords: Regression, Dividend, Firm, Inflation, Macroeconomics, Random effect, Ghana

1.0 INTRODUCTION

The objective of any business is to make profit. Dividend is defined as the distribution of profit to shareholders. Studies on dividend was initiated by Miller and Modigliani in 1961. In their study they argue

that dividend policy was irrelevant in the perfect capital market. However, later researchers such as [1] where imperfect capital market was recognized, dividend policy was found to be relevant. The subject of dividend payout in current business environment is a very important one and one of the controversial matters. For some time now, financial economists are modeling and examining dividend policies [2]. Studies by [3], [4] and [5] established "profitability, leverage, ownership structure, firm size, risk, age, firm growth, collateral capacity, board size, board independence, audit type, market-to-book ratio, institutional shareholding and dividend changes as having an effect on dividend payout".

A review of previous studies show that several studies have been done and applied different methods and variables and have covered different time spans for various countries, with very few studies considering the macroeconomic variables as the independent variables and using panel regression for the analysis. The studies also dwelled so much on dividend policy with few looking at the payment of dividends. Results from previous studies appear inconsistent against each other and based on this background, this paper seeks to statistically assess the impact of macroeconomic variables such as market capitalization, inflation, interest rate and exchange rate on dividend payouts on some firms listed on the Ghana Stock Exchange. Moreover, in Ghana, literature on dividend payout is quite scanty and the few studies, such as ([4]; [2]; [5]), have rather looked at factors that affect dividend policy and not dividend payout. The current study will contribute to literature on dividend payout and serve as a guide to future researchers in this area as well as investors and managers of businesses when they are setting dividends.
The remainder of this paper is organized as follows. Section two reviews empirical literature, section three discusses the research methodology, results of this study are discussed in section four and section five has the conclusion and recommendation.

2.0 REVIEW OF LITERATURE

"Theories on corporate dividend decisions such as agency theory, clientele effect, signaling theory, life-cycle theory and tax preference theory have been largely explained in corporate finance literature. Dividend payout is said to be the distribution of earnings in real assets among the investors of the firm in proportion to their ownership. It is regarded as the benefits of shareholders in return for their risk and investment and it is determined by different factors in an organization which include financing limitations, investment chances and choices. Dividend policy is said to be an important component of business finance as it has riveted investigators' interests and it is still a topical issue and considered to be one of the top ten unresolved issues in finance which needs more time for investigators to fully understand" ([1]; [6]).
Studies on dividend policies dwell so much on developed countries as a result USA and Europe were considered as prototypes for recent studies [7].
[8] carried out "a study on the impact of inflation and dividend policy on some US firms and established a stable long run relationship between dividend payouts and real economic activities and price level".
[9] sought to establish the factors that affect dividend payout for the manufacturing and service industries for the USA by extending the works of [4] and [10]. They found out that when the data from manufacturing and service sectors are put together as a sample, profit margin, sales growth, debt-to-equity ratio and tax, are significant determinants. However, for firms in the services industry only, profit margin, sales growth and debt-to-equity ratio were found to be significant and profit margin, tax, and market-to-book were found to be significant determinants of dividend payout for firms in the manufacturing sector only. The results supported that of [4] and [10]. They concluded that the net cash flow generated by the firms gave rise to results that were different from those obtained with the dividend payout ratios as dependent variable and also that the relationship between the dependent and independent variables for the manufacturing firms were different from those for the firms in the service industry.
[11] did "a study on non-financial firms listed on the Karachi Stock Exchange in Pakistan and found out that profitability, ownership and market liquidity had positive effect on dividend payout, but slack, leverage, market capitalization and firms' size were seen to have a negative effect on dividend payout".
[12] carried out "a study on factors that contribute to dividend decision in the engineering sector of Pakistan and found earlier dividend per share, earnings per share, profitability, cash flow, sales growth, and size of the firm as the key driving forces of the dividend policy in the engineering sector of Pakistan".

[13] studied “the relationship between interest rate, exchange rate, gross domestic product (GDP) growth rate and unemployment rate and dividend payout. Data from the State Bank of Pakistan and Official Websites of firms were used for the study. Ordinary Least Square regression (OLS) was applied to estimate the regression equation. Results from the analysis indicated that interest rate and exchange rate were positively related to dividend payout whiles inflation and GDP growth rates were found to relate to dividend payout negatively”.

[14] investigated “the impact of macroeconomic variables on financial performance of the automobile assembly sector of Pakistan Stock Exchange. They applied the Generalize Method of Moment (GMM) and their results revealed that the macroeconomic variables had negative relationship with Return on Equity (ROE), return on assets (ROA) and gross profit margin (GPM) with only inflation having a positive relationship with return on equity (ROE) but negative relationship with return on assets (ROA) and Gross Profit Margin (GPM)”.

In investigating the factors that affect dividend policies among firms listed on the Tunisian Stock Exchange with particular emphasis on the influence of the Jasmine revolution, [15] employed panel data models where they used pooled data spanning from 2003 to 2012 of firms listed on the Tunisian Stock Exchange. Results showed a positive influence of net cash flow and market-to-book value on dividend payout. However, the Jasmine revolution was seen not to have any influence on dividend payout among the firms listed on the Tunisian Stock Exchange.

[16] did a study to establish factors that affect dividend payouts among firms in Tunisia and identified profits, growth, liquidity of stock market and the firm size as factors that affect dividend payout but ownership and financial leverage were seen not to have any impact on dividend policy in Tunisia. They however, observed that dividend payouts rather depended more on current earnings than past earnings.

[17] studied the effects of macroeconomic variables on dividend payout. The author used secondary data from the Nairobi Securities Exchange and the Central Bank of Kenya on dividend payouts, inflation, interest rate exchange rate and money supply. The author used the Multiple Linear Regression model to analyze the data. Results from the study indicated that interest rate, inflation, and money supply were positively related to dividend payout while exchange rate had a negative effect on dividend payout. This study is different from [17] in the sense that this study uses the random effect model of panel regression for the analysis, the time and location of study are all different.

In order to assess the determinants of dividend payout on 30 firms listed on the Nigerian Stock Exchange, [18] employed simple linear regression analysis where they used data from 2006-2010. Results from their study showed a positive significant relationship between firms’ dividend payout and the market value of share prices. Their results were found to be in tandem with that of [4], [19] and [20].

[4] investigated the factors that affect dividend payout ratio of listed firms in Ghana and found profitability, tax and cash flow as statistically significant positive determinants of dividend payout ratio but was however inversely related to sales growth, risk institutional holding and market-to-book value. Data for the study were taken from the financial statements of firms listed on the GSE and applied the OLS model for the analysis.

[2] investigated “the effects of dividend payout on the performance of some listed firms on the Ghana Stock Exchange (GSE)”. The author used financial data of the firms from 1997 to 2004. “Outcomes of the investigation revealed an inverse relationship between return on assets, and dividend payout and leverage of the firms. This results contradicted the findings of” [4].

In 2011, [19] studied “the relationship between dividend policy and performance of some banks in Ghana. They used panel data from the financial statements spanning from 1999 to 2003 from the financial statements of sixteen (16) commercial banks in Ghana. Results indicated that on the average dividend paid by banks to shareholders during the study period was 24.65% of their earnings. The results further revealed that the performance of banks in Ghana were enhanced by the growth of the bank, leverage and size of the bank”.

In 2017, [21] applied “Principal Component Analysis (PCA) and Multiple Linear Regression Analysis to predict the relationship between firm performance and macroeconomic variables of publicly traded companies in the United Kingdom. Results from the study confirmed Real GDP, Adjusted Unemployment Rate, and Exchange Rate (Value of Foreign Currency Relative to US Dollar) as the major macroeconomic variables that significantly have predictive ability in predicting firm performance”.

[22] studied the effect of dividend policy on the performance some Banks in Ghana. The author employed the panel regression analysis method in analyzing the data where return on equity, (ROE) was used as the dependent variable, dividend per share, capital adequacy, size of the firm, growth, age of listing,

inflation, leverage, and CEO duality as the explanatory variables. Results showed a positive relationship between ROE and dividend policy. The results also showed that bank size, CEO duality, banks age of listing since initial public offer, (IPO), capital adequacy and growth in sales revenue are significant determinants of banks performance in Ghana. However, the study found inflation and leverage to be insignificant in determining the performance of the Banks under study in Ghana.

From the literature reviewed it is seen that several studies have been done and used different approaches and variables and covered different time periods for various countries, with very few studies considering the macroeconomic variables as the independent variables and using panel regression for the analysis. The findings from the studies appear inconsistent against each other and it is against this backdrop that the current study sought to statistically assess the impact of macroeconomic variables on dividend payout, using six firms listed on the Ghana Stock Exchange.

It is seen from the review of previous studies that several studies have been done and applied different methods and variables and have covered different time periods for various countries, with very few studies considering the macroeconomic variables as the independent variables and using panel regression for the analysis. The studies also dwelled so much on dividend policy with few looking at the payment of dividends. Results from previous studies also appear inconsistent against each other and based on this background, this paper seeks to statistically assess the relationship between some macroeconomic variables such as market capitalization, inflation, interest rate and exchange rate and dividend payouts on some firms listed on the Ghana Stock Exchange.

3.0 METHODOLOGY

The objective of this study is to statistically assess the impact of macroeconomic variables such as market capitalization, inflation, interest rate and exchange rate on dividend payouts by some firms on the Ghana Stock Exchange. This research used secondary data for a period of six years, from 2014 to 2019, because it is during this period that one could get consistent data. Secondary data were gathered from the Ghana Stock Exchange and other financial intermediaries. The macroeconomic statistics were taken from the Bank of Ghana data board, the Ghana statistical service, and the World Development Index.

This study is similar to the works of [23] in the sense that they used panel regression in their study, but differs from their work in the sense that they looked at the effect of dividend payout on the financial performance of manufacturing firms on the Ghana Stock Exchange (GSE) using the Return on Assets (ROA) as the dependent variable and a proxy for performance, dividend per share, leverage, firms' growth in sales and the size of the firm as independent variables. However, in this study, the author looked at the impact of macroeconomic variables such as inflation, interest rate, exchange rate and market capital on dividend payout on six firms, as they were the only firms with consistent data, listed on the GSE with data spanning from 2014 to 2019.

The general form of a panel regression equation is

$$Y_{it} = \alpha + \beta X_{it} + \mu_{it} \qquad (1)$$

The subscripts *i* and *t* represent the cross-sectional and time series dimensions of the data respectively and α and β are constant and regression coefficient respectively.

Y_{it} is the dependent variable and X_{it} is a vector of independent variables of firm *i* at time *t* and μ_{it} is the residual term.

However, the more specific panel regression equation used in this study was

$$DY_{it} = \beta_0 + \beta_{1t}MC_{it} + \beta_{2t}INF_{it} + \beta_{3t}EXRT_{it} + \beta_{4t}INRT_{it} + \mu_{it} \qquad (2)$$

Where DY_{it} is the dividend payout, MC_{it} is the money capitalization, INF_{it} is inflation, $EXRT_{it}$ is exchange rate and $INRT_{it}$ is the interest rate and β_0 and μ_{it} are as defined in (1).

Table 1 is a summary of the measurement of the variables used in this study

Table1: Variables, Measurement and Symbols

VARIABLE	MEASUREMENT	SYMBOL
Dividend payout	Dividend per share divided by earnings per share	DY
Market capitalization	Total dollar market value of a company's outstanding share of stock Ghana Cedis	MC
Exchange rate	Bilateral exchange rate, Bank of Ghana	EXRT
Interest rate	Monetary policy rate	INRT
Inflation	Consumer Price Index	INFL

The robustness of this model was checked by using the variance inflation factor (vif) to check for the presence of multicollinearity among the variables. The F-test was also used to choose between fixed effect and the pooled OLS. The Hausman test was then conducted to see whether individual effects were uncorrelated with the other regressors in the model as well as test for consistency and efficiency of the random effect estimators. All these were done with the aid of the statistical software, STATA 14.0.

4.0 RESULTS AND DISCUSSION

4.1 Descriptive Analysis

The descriptive statistics of the variables used in this study are shown in Table 2. From the table, the average dividend payout during the period under study is GHS*1.811*, with a standard deviation of *1.238*, a minimum dividend paid was GHS*0.002* and a maximum of GHS*4.879*. Market capitalization during the study period had an average of GHS1639.35, a standard deviation of 143.552, a minimum of GHS1283.463 and a maximum of GHS1887.137 was invested into the market. Inflation was between 7.6% and 19.2%, a standard deviation of 3.570 and an average of 13.50%. Exchange rate was between GHS2.321 and GHS5.538 to one US dollar, with a standard deviation of 0.756 and a mean exchange rate of GHS4.113 to one US dollar. Interest rate within the study period was between 14.52% and 26.0%, a standard deviation of 4.517 and a mean interest rate of 19.22%.

Table 2: Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
DY	1.811	1.238	0.002	4.879
MC	1639.353	143.552	1283.463	1887.137
INF	13.499	3.571	7.600	19.200
EXRT	4.113	0.756	2.321	5.538
INRT	19.219	4.517	14.520	26.000

Source: Author's own estimation, Stata 14.0 output,

Note: Values rounded to 3 decimal places

4.2 Diagnostic Test

In order to ascertain the presence of multicollinearity in the data, the Pearson Product Moment Correlation coefficient was employed. The results are shown in Table 3. From the table the lowest correlation coefficient is *-0.007* and the largest is *-0.876*. From these results, none of the coefficients is greater than 0.9, an indication of the absence of collinearity among the variables Gujarati (2009).

Table 3: Correlation Matrix

	DY	MC	INF	EXRT	INRT
DY	1.000				
MC	-0.633	1.000			
INF	0.603	-0.232	1.000		
EXRT	-0.344	-0.007	-0.740	1.000	
INRT	0.263	0.147	0.771	-0.876	1.000

Source: Author's Stata 14.0 output,

Table 4 is the results of the variance inflation factor (VIF) and tolerance test that were run to test for the presence or absence of multicollinearity among the variables. From the Table 4, all the VIF values of the individual variables as well as the mean VIF value are less than 10, a confirmation of the absence of collinearity among the explanatory variables.

Table 4*:* Table showing the Variance Inflation Factor for the independent variables

Variable	VIF	Tolerance
Intrt	6.57	0.1152126
Exrt	4.63	0.216208
Infyoy	3.55	0.282008
Mc	1.50	0.665623
Mean VIF	4.06	

4.3 Breusch and Pagan Lagrangian Multiplier Test for Random Effect

In order to ascertain whether individual specific variance components were zero or not, the Breusch and Pagan Langrangian Multiplier test was carried out.

Hypotheses:

$H_0: \sigma_\mu^2 = 0$

$H_a: \sigma_\mu^2 \neq 0$

Results from the test showed a *chibar2(01) = 6.04* and statistically significant (*P-value of 0.0007).* On the basis of the results the null hypothesis (H_0) was rejected in favour of the alternative hypothesis (H_a) confirming that the data cannot be pooled, hence the random effect model would be the ideal one and can also deal with heterogeneity better than the pooled Ordinary Least Squared regression model.

4.4 Hausman Test

The author carried out the Hausman test to see whether individual effects were uncorrelated with the other regressors in the model as well as test for consistency and efficiency of the random effect estimators.

4.4.1 Hypotheses:

H_o: Random effects would be consistent and efficient

H_a: Random effects would be inconsistent

The test results indicated that at 10% level of significant we fail to reject the null hypothesis, as the test returns with a *p-value of 0.9847* and so, like the *Breusch-Pagan Langragian Multiplier* test, the random effect model is the most suitable model for this study. These results imply that even though the firms' effect were present in the data set, they were not correlated with the macroeconomic variables and so can be taken as random. Hence one can conclude that the random effect estimators are consistent and efficient.

Table 5: Random Effect Regression Estimates of the impact of Macroeconomic Variables on Dividend Pay-out

	coefficient	Std. Err.	Z	P>z
MC	-0.004	0.001	-3.46	.002
INF	0.220	0.061	3.62	.001
EXRT	-0.254	0.289	-0.88	.38
INRT	-0.075	0.062	-1.20	.23
Constant	7.647	2.584	2.96	.003
R^2 = 0.8116				

Wald chi2(4) = 133.57 *Prob > chi2 = 0.0000*

Source: Authors own estimation

Three panel regression models (OLS, FE and RE) were run. Among these models, it was the RE model that was seen to be robust and as such the results is based on the RE model. The results from the model indicates that the model has a Wald chi-squared value of 133.57 with a *P-value* of *.000* which is highly significant at *1%* level, an indication of a significant relationship between the dependent and independent variables used in this study and that this model fits the data well at 1% significance level, an indication that overall the model is statistically significant. The model has an R^2 value of 0.8116, which means that 81.16% of the variation in the dividend payout has been explained by this model. This is an indication that

there are other variables that make up 18.84% that also explains the variation in the dividend payout which have not been included in this study.

The coefficient of Market capitalization is negative and significant at 1% level (P-value of .001), an indication that a unit change in Market capitalization decreases dividend payout by GHS0.004, if the other variables are held constant. This could be that, firms with high market capitalization may have better growth potential and needs to finance the growth than those with low market capitalizations [24]. This finding is consistent with other empirical studies such as [24], [25] and [11]

On the part of Inflation, the coefficient (0.220) is positive and highly significant (*P-value of .000*) at 1% level. This means that if inflation is increased by 10 units, dividend payout will increase by 2.20 units, if the other variables are kept constant. This is an indication that inflation has a positive impact on dividend payout in the study period. This results supports the findings of [14], [8], [17], and [26]. The results however refutes the findings of [27].

Exchange rate is seen to be negatively related to dividend payout. The coefficient (-0.254) is statistically insignificant (*P-value of .38*) at 10% level. The coefficient indicates that when the US dollar is increased by one unit the Ghanaian cedi depreciates in value and the dividend payout is reduced by 25.4%, if the other variables are held constant. This result is in tandem with the findings of [17], but contradicts the findings of [27], and [13].

Interest rate is also seen to be negatively related to dividend payout. Though its coefficient *(- 0.075*) is statistically insignificant (*P-value of .23*) at *10%* level. This means that if the other variables are kept constant a unit change in interest rate will lead to a decrease in dividend payout.

5.0 CONCLUSION

The aim of this study was to statistically assess the relationship between macroeconomic variables such as market capitalization, inflation, exchange rate and interest rate and dividend payout for some listed firms on the Ghana Stock Exchange Market. The findings show that market capitalization has a negative relationship with dividend payout to shareholders, whereas inflation rate has a positive relationship with dividend payout. However, interest and exchange rates showed no significant relationship with dividend pay-out to shareholders in this study. The model employed for the study was also seen to be statistically significant.

It will be recommended that policy makers should review the influence of inflation and market capitalization in order to improve on the dividend payout of investors on the GSE.

Future studies could be done to determine whether investment decisions by investors are taken based on dividend payout or not.

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COMPETING INTERESTS

The author declare that there is no competing interests

AUTHORS' CONTRIBUTIONS

The study design, through data analysis were done by the author

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