

THE EFFECT OF MACROECONOMIC VARIABLES ON CAPITAL MARKET PERFORMANCE: A CASE OF GHANA STOCK EXCHANGE

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ABSTRACT

The stock market is a monetary establishment that advances the development and improvement of the economy of a country. The purpose of the study is to investigate the effect of Macroeconomic variables on the stock market performance in Ghana. The study focused on the impact of the foreign exchange rate, interest rate and inflation rate fluctuation on the market performance of the Ghana Stock Exchange. The study used secondary quarter-time series data for thirty years from 1990 to 2019. The unit root test was employed utilizing the Augmented Dickey-Fuller (ADF) test to assess the stationarity in the data. The regression analysis was employed to evaluate the influence of the macroeconomy variables on the stock market performance, market capitalization was used to measure stock market performance. The results indicate that inflation and exchange rate have a positive effect on capital market performance, while interest rate exerts a negative impact on capital market performance. It implies that an increase in both the inflation rate and exchange rate would enhance capital market performance while an increase in interest rate would reduce the capital market performance.

Keyword: Stock Market Performance, Foreign Exchange Rate, Interest Rate, Inflation, Macroeconomic Variables, Granger Causality, Regression Model, Economic Development, Ghana Stock Exchange.

1. INTRODUCTION

1.1 Background of the Study

Capital market is a monetary establishment where reserve funds and speculations are channels between providers or financial specialists who have the capital and need to contribute and, the individuals who require reserves. Capital market assumes a noteworthy job in building an economy by making accessible long-term assets to government and ventures who needs assets for developmental projects and expansion of business activities respectively. One of the issues faces by each country is income preparation. Compelling and proficient asset assembly in an economy cultivates practical development and advancement, in this manner finances must be viably activated and apportioned to empower the economy to acknowledge ideal yield (Osinubi, 2010). Pakistan Economic Survey (2011), has shown that the capital market, as other currency

markets, assumes a huge job in the national economy. A developed, dynamic, and energetic capital market can contribute essentially to expedient monetary development and advancement. It prepares assets from individuals for additional investment in the gainful channels of an economy, initiating inactive money related assets and placing them into legitimate investment. The performance of a stock market of an economy is important to different parties including investors, capital markets regulators, the stock traders, and government among, others. Stock market performance is impacted by a few variables key among them are the activities of governments and the overall performance of the economy. Financial exercises do influence stock market performance. Corrado and Jordan (2002) brought up the inflationary rate among, others as a factor that could impact the market performance. Inflation is a circumstance in the economy where an overall degree of cost of a unit of nation cash viably purchases not as much as what it purchases beforehand. Inflation is the rate at which the overall degree of costs for merchandise and enterprises is rising and, disintegrate the buying intensity of cash.

The past studies on macroeconomic variables on stock market performance, return, liquidity and all-shares index have failed to provide a uniform direction on the impact of macroeconomic variables on the market performance [E.g. Seleem and Noefian (2006); Sohail and Hussan (2009); Isshaku et al. (2013); Abrham (2017); Barakat (2015) and Giri and pooja (2017)]. The mixed result in the empirical literature was due to the fact the researchers have use a different set of explanatory and dependent variables in distinct economic jurisdictions of varying economic trends and situations [for e.g. Seleem and Norfian (2006) used interest rate, inflation and exchange rate on Pakistan Stock Market found a negative impact; Sohail and Hussain (2009) used consumer price index, industrial production index, real effective exchange rate and money supply had both negative and positive relationship on stock return; Issahaku et al. (2013) used inflation, money supply and foreign direct investment; T. Abraham (2017) used inflation, interest and exchange rate on Nigerian Stock Market;,.e.t.c] it has also be revealed that these studies have intensively looked at the relationship between inflation and stock price, stock returns, all-share index and liquidity as determinants of capital market performance with different variables and varied methodologies which are extremely limited as they ignore market capitalization as measure of stock market performance. The current study, however, addressed this inadequacy by incorporating market capitalization into the performance. In Ghana, macroeconomic variables such as inflation rate, interest rate and exchange rate have been an issue confronting policymakers, investors, analysts and economists. It is one of the main factors that could derail the economy of any nation. The stock market that also contributes to economic growth, will invariably be affected by these variables, hence the need for this research.

Objectives of the Study

The objectives of this study are as follows:

- i. To investigate the extent to which inflation rate fluctuations impact on stock market performance
- ii. To establish effects of interest rate fluctuation on stock market performance
- iii. To examine effects of foreign exchange rate fluctuation on stock market performance

2. THEORETICAL REVIEW

This research is based on the following theories.

2.1. Interest rate theory

In the classical theory, the amount of savings and investment were equated by a fluctuating interest rate. Economists and government policy makers have found that both savings and investment are not just influenced by changes to the interest rate. Investment is also influenced by prices and government taxes and other policies. But even taking these variables into account, economists cannot explain all of the fluctuations in investment. Influential British economist John Maynard Keynes hypothesized that investment is dependent on the "animal spirits" of entrepreneurs. In other words, interest rates are definitely important in savings and investment, but they don't tell the whole story.

2.1.2 Monetary Theory of Inflation

Monetarism speaks of the followers of M. Friedman (1912-2006) who opines that "only money matters", and as such monetary policy is a more potent instrument than fiscal policy in economic stabilization. According to the monetarists, the money supply is the "dominant, though not exclusive" determinant of both the level of output and prices in the short run, and of the level of prices in the long run.

2.1.3 The Market-Segmentation Theory

The market-segmentation theory focuses on the hedging behaviour of market participants. The forces of supply and demand in segmented markets determine the yields in those markets. Since markets are segmented on the basis of maturity with preferences tied to hedging behaviour, there is no linkage by formula between short- and long-term interest rates as in expectation-based theories. Companies that require liquidity, such as commercial banks, non-financial corporations, and money-market funds, dominate the short-term segment. Their maturity needs (or habitat preferences) lead them to attempt to hedge their balance sheets by investing in short-term assets.

2.2 Empirical Review

2.2.1 Foreign Exchange rate volatility and stock market performance

Exchange rate is defined as the price at which a country's currency can be exchanged for another country's currency. Exchange rate movement affects output levels of firms and also the trade balance of an economy. Share price movements on the stock market also affect aggregate demand through wealth, liquidity effects and indirectly the exchange rate. Specifically, a reduction in stock prices reduces wealth of local investors and further reduces liquidity in the economy.

Bailey and Chung (1995) conducted a study on Exchange Rate Fluctuations, Political Risk, and Stock Returns at the Mexican stock market and the results proved there is a positive relationship between exchange rate fluctuation and stock market return. However, other studies that found a positive relationship between exchange rate fluctuations and stock return volatility include, Smith (1992), Solnik (1987), Aggarwal (1981), Frank and Young (1972), Phylaktis and Ravazzolo (2000), Granger *et al.* (2000), Abdalla and Murinde (1997), and Apte (2001). Benita

and Lauterbach (2004) found that exchange rate volatility has real economic costs that affect price stability, firm profitability and a country's stability.

2.2.2 Interest rate volatility and stock return volatility

The interest rate can be defined as the annual price charged by a lender to a borrower in order for the borrower to obtain a loan. This is usually expressed as a percentage of the total amount loaned. Traditional theories define interest rate as the price of savings determined by demand and supply of loanable funds. Ngugi and Kabubo (1998) states that the primary role of interest rate is to help mobilize financial resources and ensure the efficient utilization of resources in the promotion of economic growth and development. hen *et al* (1986) indicated that interest rate had positive impact on stock return.

Chen *et al* (2005) again found that the interest rate was not significant for Taiwan hotel stock return. Nguyen (2007) found interest rate spreads had a significant effect on the riskiness of capital-intensive industries. Chiang *et al* (2009) realized interest rate was negative toward Singapore hotel stock return. Specifically, besides, Kandir (2008) studied the Turkish market and found a positive relationship between interest rates and stock return. According to Barnor (2014), a rise in interest rate influences investing decisions, thus investors make changes in their investment structure, generally from capital market to fixed income securities. Obura&Anyango (2016) also defined interest rate as the price of savings determined by demand and supply of loanable funds

2.2.3 Inflation rate volatility and stock market performance

The inflation rate is the rate of increase of a price index (for example, a consumer price index). It is the percentage rate of change in price level over time. The rate of decrease in the purchasing power of money is approximately equal (Mishni, 2004). Research study has also been conducted to determine the effects of inflation on stock market. Most scholars used consumer price index (CPI) to substitute inflation. CPI was often used to reflect the products and prices about the general public. Most studies reveal inflation had negative impact on stock return. Liljeblo $et al$ (1997) also found the Finnish data of stock market was affected by inflation. In the industries analysis, Kavussanos $et al$ (2002) found that there were a few industries that have negative influence, such as electronic sectors.etc, In predictability, the inflation is limited. (Rapach $et al$,2005), (Chen *et al*,1986). On the contrary, they considered inflation had no ability in predicting stock return. (Chan,1998), (Chen,2005).

Based on above findings, we predict that the variable of inflation has a negative impact on stock returns. Chinzara (2011) in his study on macroeconomic uncertainty and stock market volatility for South Africa found out that stock market volatility is significantly affected by macroeconomic uncertainty, that financial crises raise stock market volatility, and that volatilities in exchange rates and short-term interest rates are the most influential variables in affecting stock market volatility whereas volatilities in oil prices, gold prices and inflation play minor roles in affecting stock market volatility.

3. RESEARCH METHODOLOGY

3.1 Research Design

This study was conducted using causal research design. Causal research explores the relationship between variables, that is, the effect of one thing on another and more specifically, the effect of one variable on another (Mugenda and Mugenda, 2003). The population of interest in this study was 40 companies listed on the Ghana Stock Exchange at the end of 2019 and whose shares are actively trading. The sample for this study consisted of all 40 companies listed on GSE. Inflation rate; Interest rate; and Exchange rate were used. Inflation was measured through the consumer price index (CPI) while capital market performance was measured by market capitalization. The Augmented Dickey Fuller (ADF) test was applied to estimate the unit root. ADF tests normally check the stationarity series where; if the ADF statistics exceeded the critical value, the null hypothesis of unit root in the series was rejected. The Granger causality test was used to determine the relationship between the dependent and the independent variables.

Conceptual Model

The conceptual framework of this study spells out the relationship between stock market performance (dependent variable) and macroeconomic variables, which are inflation rate; interest rate and exchange rate (independent variables). The study therefore sought to investigate the effect of the independent variables' fluctuations on dependent variable (Stock market performance). The conceptual model as brought out from the literature review in this study is illustrated in the figure below

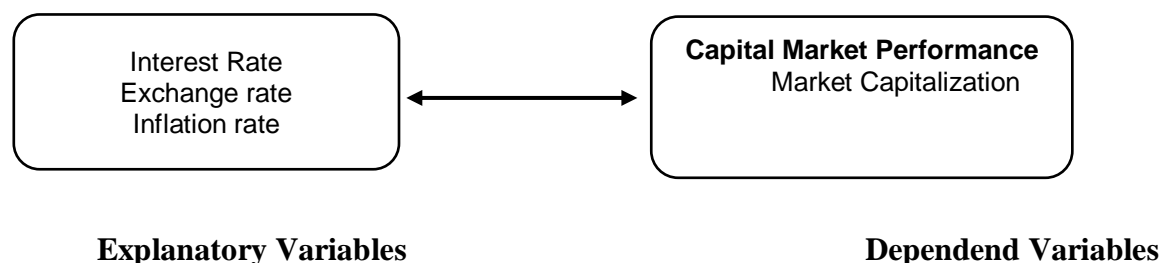


Figure 2.1 Conceptual Model

This is mathematically represented as follows:

$$Y_t = \beta_0' + \beta_1' \times_1 + \beta_2' \times_2 + \beta_3' \times_3 + \beta_4' \times_4 + \varepsilon_t$$

Where,

Y_t = Stock market performance measured using quarterly market capitalization

X_1 = Inflation measured using the annual consumer price index

X_2 = Interest rates measured using annual monetary Policy Rate

X_3 = Exchange rate measured using annual average Ghana Cedis per unit of US dollar

β_0 = Constant

B_i = Coefficient

$\beta_1 - \beta_4$ = Regression Coefficients

ε_t = Error term

4. DATA ANALYSIS AND PRESENTATION

4.1 Introduction

This section focuses on the empirical estimation, presentation and economic interpretation of the regression results carried out using the methodology highlighted in the previous section.

Table 4.1

	MARKETCAP	INTR	INFR	EXCHR
Mean	10298.04	73.74359	58.54940	4.339846
Median	2753.800	69.00000	49.05000	2.717000
Maximum	387028.0	135.0000	210.2000	16.39630
Minimum	0.630000	39.00000	23.74000	0.103100
Std. Dev.	37971.28	29.37603	37.21286	4.522945
Skewness	8.749257	0.810789	2.156998	1.226765
Kurtosis	85.21217	2.585243	8.240744	3.271578
Jarque-Bera	34442.06	13.65750	224.6203	29.70613
Probability	0.000000	0.001082	0.000000	0.000000
Observations	117	117	117	117

In the Table 4.1 below, descriptive statistics of the dependent and explanatory variables were used in the study for the period 1990 to 2019. Maximum and minimum statistics rule out the possibility of outliers in the data used. Classical linear regression requires that the residuals be normally distributed and judging by the probability values of the Jarque-Bera, all the four variables residuals do not follow a normal distributed therefore, the test for correlation among the variables can be conducted.

4.2 Correlation Matrix

The correlation analysis was performed to measure the strength and direction of the linear relationship between the two variables.

Table 4.2 Result of correlation

	MARKETCAP	INTR	INFR	EXCHR
MARKETC				
AP	1.000000	-0.193660	-0.184716	0.446163
INFR	-0.184716	0.698215	1.000000	-0.406758
INTR	-0.193660	1.000000	0.698215	-0.451711
EXCHR	0.446163	-0.451711	-0.406758	1.000000

In this study there is strong multi-collinearity among variables as reflected by the coefficient of 0.8 which is close to 1. The correlation tests show a negative relationship between the three macroeconomic variables under study such as exchange rate, inflation rate and interest rate.

Stationarity Tests

The stationarity or unit root test of the data used in this study were conducted using Augmented Dickey Fuller Test and the results are shown below.

The study compared test statistic value with that of test critical value at 5% significance and considering p-value and it has been indicated that three variables (*INFR*, *INTR* AND *EXCHR*) had unit roots. This is because the absolute values of the ADF test statistic for each of these variables were less than the absolute variables of the test critical values at 5%. In addition, the p-values corresponding to each of the ADF test statistics for these variables were greater than 5% (0.1454, 0.2442 and 1.0000), respectively. In this case, the null hypothesis of no unit roots in the data series could not be rejected and therefore accepted. However, the variables with unit root have been transformed into first difference to bring stationarity in these data, thereafter, the modified data was used in the regression model in the study.

Table 4.3 Result of Augmented Dickey- Fuller (ADF) Stationarity Tests

	ADF Test Statistics	Test Critical Value at 5%	*P - Value
MARKETCA			
P	6.967599	2.886509	0.0000
INFR	2.395345	2.887665	0.1454
INTR	2.102460	2.886732	0.2442
EXCHR	2.824736	2.886732	1.0000

**MacKinnon (1996) one-sided p-values.*

Table 4.4 Result of Augmented Dickey- Fuller (ADF) Stationarity Tests 1st Difference

	ADF Test Statistics	Test Critical Value at 5%	*P - Value
INFR	7.517969	2.887425	0.0000
INTR	6.447216	2.886732	0.0000
EXCHR	14.78432	2.886732	0.0000

**MacKinnon (1996) one-sided p-values.*

4.5 Ordinary Least Squares Estimation

The study proceeded to estimate the OLS equation. The results are shown in table 4.5 below.

Table 4.5 Ordinary Least Squares (OLS) Results.

Dependent Variable: LMARKETCAP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INFR	0.516238	0.301782	1.710630	0.0899
INTR	-1.944921	0.454592	-4.278385	0.0000
EXCHR	1.882604	0.090711	20.75382	0.0000
C	11.29318	1.457454	7.748568	0.0000

R-Squared= 0.888899

Adjusted R-Squared= 0.885949

F-Statistic= 301.3642

Durbin Watson Statistic (DW) =0.69279

Table 4.5 above shows the estimated results demonstrating the coefficient values of the explanatory variables as well as indicating through the question show each respective variable impacted on dependent variable. According to the estimated model above, the relationship between market capitalization and inflation rates shows a positive coefficient of 0.516238, against a P-value of 0.0899. This indicates that a unit increase in inflation would result in 0.05 impact on market capitalization, hence a statistically insignificant P-value. Interest rate exhibited a negative coefficient of 1.944921, against a P-value of 0.000. This means that a unit increase in interest rate would result in 1.94 a decrease in market capitalization, hence a statistically significant P-value. Again, the results indicated that exchange rate has a positive coefficient of 1.882604 with a P-value of 0.000. It implies that a unit increase in exchange rate would result in 1.88 impact on market capitalization. Exchange rate is statistically significant. The value of the adjusted R-squared is 89%, signifying 89% variation in market capitalization is explained by the variation in the independent variables. The DW of 0.69 means that there is a serial correlation in the variables because the value is less than two (2).

5. CONCLUSION

This study found out that an increase in the general price level (inflation) has an insignificant impact on capital market performance. The result also shows that interest rate has significant negative impact on capital market performance and that of exchange rate has positive effect on capital market performance. These results have important policy implications for both domestic policy makers and development partners, on how macroeconomic variables such as inflation rate, interest rate and exchange can be checked to encourage investment in capital market securities, hence promoting economic growth.

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