

Internal and External Drivers of Stock Market Returns in Ghana and Nigeria: DOLS and FMOLS Approaches

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This paper investigates the impact of macroeconomic (external and internal) and political variables on returns of the Ghanaian and Nigerian stock markets. The study employed the Fully Modified Least Square and Dynamic Least Square models to ensure that the results are efficient, robust and reliable. Whilst lag of stock market returns and real gross domestic product exert positive effect of stock market returns, the effect of treasury bills, consumer price index and exchange rate are negative. Crude oil prices, LSE all share index and political cycle give diverse results. The study indicates that a key driver of stock market return is its lag. Policy direction that consistently aims at developing and implementing sound, stable and sustainable macroeconomic environment to promote stock market performance was recommended.

Keywords: stock market return, macroeconomic variables, Ghana, Nigeria

INTRODUCTION

Sub-Saharan Africa economies have experienced rapid growth in the number of stock exchanges in the last three decades mainly as a result of extensive financial sector reforms undertaken by governments of these countries (Osinubi, 2004; Adam and Siaw, 2010). The reform package included the promotion and development of stock markets. To accomplish this goal, the Ghana Stock Exchange and other stock exchanges have been established in the region in addition to the Nigeria Stock Exchange, which has been operating since 1960. The rapid development of the stock market sector points to the commitment towards private sector growth and ultimately economic growth through mobilisation and channelling of long term investible funds to business firms. Regardless of the contributions of the stock market, scholars have argued that the stock market could have a significant impact on economic growth with the efficient management of the macroeconomic variables (Adam and Tweneboah, 2008; Kuwornu and Owusu-Nantwi, 2011; Antwi et al., 2013; Chia and Lim, 2015; Barakat et al., 2016; Jareño and Negrut, 2016). The significance of the stock market to the growth of an economy is therefore linked to satisfactory governance and appropriate regulatory framework.

A significant number of studies have reported on the link between macroeconomic factors and stock market return using a number of statistical models and establishing the reliability of such models with justifications after the introduction of the Arbitrage Pricing Theory by Ross (1976). These studies, and some significant others stress, that macroeconomic variables have a strong propensity to determine changes in stock market returns. It is imperative to state that most past empirical works on the relationship between macroeconomic variables and the stock market return in Sub Saharan Africa (SSA) have concentrated on a

few macroeconomic factors. Variables such as political risk and influence of external stock markets that also have the tendency to influence stock market returns in SSA have been ignored. Fairly recent studies however have indicated the likely influence of internationally recognised stock market returns on those in emerging and developing economies (Kim et al., 2005; Diebold and Yilmaz, 2012). Nearly all SSA countries are characterised by political risk of some sort. Disagreements and conflicts between members of different political parties, negative pronouncements from political leaders and unfavourable policies initiated by governments have the propensity to adversely affect stock market performance in West African countries.

It is important therefore for a research that captures other salient internal and external variables that have been reported by previous studies especially outside SSA to have significant effect stock market returns to be undertaken.

The rest of the paper is structured as follows: the next section reviews relevant literature in the subject area. The third section discusses the methodology employed for the study, followed by analysis of data and discussion of results under section four. The final section captures the concluding remarks and limitations of the study.

LITERATURE REVIEW

The Arbitrage Pricing Theory (APT) of Ross (1976) which is the theory underpinning this study asserts that stock returns can be explained by changes in multiple factors. The theory explains that the expected return of an asset is influenced by their factor sensitivity mainly from macroeconomic variables such as changes in interest rates, economic growth, exchange rate and inflation as well as capturing the influences of non-market factors on securities. However, the APT has a number of shortcomings, the main one being the multiple factor nature of the model. The researcher is given the room to select variables he/she deems fit for the market studied. Dritsaki (2005) asserts that the most important thing in selecting macroeconomic variables is to ensure that those variables would objectively reflect the general situation in the country. Kuwornu and Owusu-Nantwi (2011) on the other hand stressed that the selection of variables should be influenced by the various works that have been carried out and reviewed in literature about their relationships with stock returns. A number of studies however emphasized the frequent use of inflation rate, interest rate and exchange rate as commonly used to explain stock movements.

Empirical Review

Lag of Stock Market Return

Recent studies have revealed that immediate past indexes have significant effect on current indexes. This implies that a good immediate past performance of the stock market is likely to have positive effect on the current performance of the stock market. The results reinforce the assertion that the performance of stock markets can be self-enhancing. Osisanwo and Atanda (2012) and Er and Vuran (2012) in their studies on Nigerian and Istanbul stock exchanges respectively found that immediate past stock market index affects the present index. Investors can therefore capitalise on this phenomenon and make significant short-term gains.

Inflation and Stock Market Returns

Empirical studies just after Ross (1976) established a negative relationship between stock market returns and inflation (Geske and Roll, 1983; Fama and Schwert, 1997). They explain that an increase in inflation is predicted to cause the nominal risk-free rate to increase, which in turn results in an increase in the discount rate used in stock valuation. These findings have been buttressed by later studies such as Ratanapakom and Sharma (2007), Ahmed and Mustafa (2012) and Otieno et al., (2017). Choudhry (2000) on the other hand finds a positive relationship between inflation rate and stock returns. His finding is supported by Maysami et al., 2004; Ibrahim and Aziz, 2003, Ochieng and Oriwo, 2012 and Ouma and Muriu, 2014).

The contrary results beg for more empirical enquiries to validate the link between the two variables.

Interest Rate and Stock Market Returns

Interest rate plays a key role in determining the amount of investments in stocks. It is expected to be inversely related to market returns either through the inflationary or discount factor effect (Abugri, 2008). Normally, increase in interest rate makes money market securities such as treasury bills more rewarding as against capital market instruments. This phenomenon creates reduction in demand for stocks and ultimately reduction in stock market index. Interest rate is therefore perceived to predominantly exert a negative influence on stock market returns (Maysami et al., 2004; Gan et al., 2006). Contrary to these results however, few studies have reported a positive influence of interest rate on stock market returns (Hasan et al., 2000).

Exchange Rate and Stock Market Returns

Most previous empirical researches report that a devaluation of the domestic currency exerts a negative impact on stock market return (Geske and Roll; 1983; Adam and Tweneboah, 2008; Ahmed, 2008; Adjasi et al, 2008; and Mahmood and Dinniah, 2009). On the contrary, a significant number of studies also confirm that exchange rate positively influences stock market returns (Maku and Atanda, 2010; Aurangzeb, 2012; Kuwornu, 2012; Okoli, 2012; Bornholt, 2013; Issahaku et al., 2013; Bondzie et al., 2014). The results of previous studies on the link between exchange rate and stock market performance also seems to be incongruous.

Gross Domestic Product (GDP) and Stock Market Returns

Finance scholars have argued that economic output of a country is measured by gross domestic product (Lakstutiene, 2008). Growth in GDP, all other things being equal, will lead to economy growth, including the stock market (Chandra, 2004). Empirical studies have generally established that real GDP exerts a positive influence on stock market returns (Fama, 1981; Fama, 1986; Ibrahim and Aziz, 2003; Oskooe, 2010). This study sought to verify the existence of such relationship for the Ghanaian and Nigerian economies using monthly computed real GDP instead of annual and quarterly GDP employed in some previous studies (Tursoy et al., 2008, Kumar, 2011)

Crude Oil and Stock Market Return

Crude oil is considered as an important factor of production globally. An increase in crude oil prices results in reduction in real economic activities in all sectors of an economy including the financial markets. Empirically, crude oil prices have been reported to have an impact on stock returns. Basher and Sadorsky (2006) established a strong evidence of susceptibility in stock market returns and this can be attributed to changes in crude oil prices. Similarly, Arouri and Rault (2011) reported that crude oil price has a positive impact on stock prices in all the Gulf countries studied except Saudi Arabia. Again, Kpanie et al. (2014) recorded a positive coefficient at lag 1 for crude oil prices even though the result is not significant

Buyuksalvarci (2010) however reported an incongruous result of negative relationship between crude oil and stock market returns of Turkey. Similarly, Kuwornu and Owusu-Nantwi (2011) and Kuwornu (2012) reported of negative relations between crude oil prices and stock market returns in their studies on the Ghanaian stock market.

Political Cycle (Risk) and Stock Market Return

Political risk has been reported to have an effect on macroeconomic factors including stock market returns (Karolyi, 2006). Political risk is perceived to be one of the key determinants of stock market performance and the financial market in general. It emanates from political events such as a new piece of unfavourable legislation, activities of governments, coup d'etat, general elections among others. Previous studies have reported that political conflicts that occur mostly during political elections generate economic uncertainty, which results in investors' risk aversion (Bialkowski et al., 2008). Though, the research findings of political events such as general elections on stock market return vary a lot depending on the country investigated, how stock markets are influenced by various political events are of great concern to investors and researchers.

Influence of Advanced Stock Market (Co-movement of Stock Markets)

Previous studies on co-movement of stock markets address the effect of stock markets of advanced countries on those of developing or emergent markets (Kim et al., 2005; Syriopoulos, 2007; Valadkhani and Chancharat, 2008; Marimuthu (2010); Diebold and Yilmaz, 2012; Dhanaraj et al., 2013; Syriopoulos et al., 2015;). There is however little research undertaken on co-movement between internationally recognised stock markets and SSA stock markets. The only exception is South Africa which has been covered in a number of similar studies. Indices of the major international stock markets such as the New York Stock Exchange and the London Stock Exchange are likely to have impact on SSA stock markets as a result of current global integration. The London Stock Exchange is perceived to have an impact on the stock markets of Ghana and Nigeria by virtue of the political and economic ties between the two West African countries and Britain.

DATA AND METHODOLOGY

Theoretical Model

In adhering to prominent scholars such as Chen et al (1986), Adam and Tweneboah (2008), Kowornu (2012) and Nkoro and Uko (2013) who have employed the APT theoretical framework proposed by Ross (1976) to empirically explore the macroeconomic determinants of stock market returns, the following empirical model is used for this study:

$$SMR_t = \beta_0 + \beta_1 SMR_{t-1} + \beta_2 CPI_t + \beta_3 TBILL_t + \beta_4 EXR_t + \beta_5 RGDP_t + \beta_6 OIL_t + \beta_7 LSE_t + \beta_8 POL_t + \mu_t \quad (1)$$

where

SMR	=	All share index (proxy of stock market returns)
SMR _{t-1}	=	Lag of all share index
CPI	=	Consumer price index (inflation) as a proxy for inflation
TBILL	=	Nominal 91 day Treasury bill rate as a proxy for interest rate
EXR	=	Nominal exchange rate between the Ghana cedi and the US dollar
RGDP	=	Real gross domestic product growth rate proxy for economic growth rate.
OIL	=	World crude oil prices
LSE	=	London Stock Exchange all share index proxy for LSE stock market returns
POL	=	Political Cycle - periods of national elections in the typical SSA country

Equation 1 shows the model employed for this study. Two control variables, LSE and POL were used for this study since it is plausible for these variables to exert an effect on the Ghana Stock Exchange (GSE) and the Nigeria Stock Exchange (NSE) market Index. The study did not take into account money supply as an explanatory variable. In the views of monetarists (Friedman, 1970; Tymoigne and Wray, 2013), money supply can reflect in excess liquidity and for that matter inflation which is the main bane of most African economies. Money supply and inflation if placed in the same equation can lead to multicollinearity. For that matter money supply was not added to the model for this study.

A significant number of previous SSA scholars employed either annual or quarterly data for their studies on the link between macroeconomic variables and stock markets. This trend was as a result of non-availability of monthly GDP from SSA countries. Scholars who employed monthly data for their studies were compelled to use industrial production index (IPI) as an alternative measure of economic growth (Hussin et al, 2012; Ibrahim and Musah, 2014; Asaolu and Ogunmuyiwa, 2011). This study used computed monthly real GDP data from quarterly data using the Chow-Lin interpolation procedure employing Matlab temporal disaggregation library developed by Abad and Quilis (2005). Estimated monthly real GDP from quarterly real GDP is arguably a preferred proxy for measurement of economic growth since it captures all economic activities of the entire economy.

In addition, the study also used political or election cycle of Ghana and Nigeria as a proxy for political risk. The upsurge of political violence and provocative utterances from political leaders that come with

national elections have made it imperative to add political cycle to the model used for this study. Changes in regimes, pronouncements of political leaders, violence before and after general elections are reported by scholars to have effect on stock market performance (Bialkowski, et al., 2008).

Again this study deviates from the norm of relying on internal determinants. The issue of co-movement of stock markets has become a leading research topic in recent times as a result of the impact of advanced stock market on the performance of other markets mainly in the developing world. The LSE all share index as a proxy for advanced stock market index was selected as a result of the economic and political link between UK and the two West African countries selected for this study.

Monthly data on interpolated real GDP, LSE all-share index and political cycle were included as responses to meet suggestions made by Kuwornu and Owusu-Nantwi (2011), Kuwornu (2012), Ouma and Muriu (2014) to include other salient macroeconomic and other variables that are likely to improve stock market return predictions, and because these variables have shown to be important determinants of stock market returns in previous studies. These internal and external variables were added to the model specification based on their importance to the survival of the economy.

Finally, the study also maintains that the performance of stock markets can be self-enhancing. That implies that previous stock market indexes can have effects on the current index. Past stock market indexes of stock markets are therefore employed as explanatory variable in the model employed for this study. The description of variables employed for this study and their sources are capture in Table 1

TABLE 1
VARIABLE DESCRIPTION AND INFORMATION DEPICTING VARIABLES USED FOR THE STUDY AND THE SOURCES OF DATA ON THE VARIABLES

Notation	Variable	Brief Description of Data	Sources
SMR	Stock Market Index	Monthly GSE Composite Index as proxy for stock market return.	Statistical Departments of Ghana Stock Exchange and Nigeria Stock Exchange.
CPI	Consumer Price Index	Monthly consumer price index used as proxy for inflation.	Websites of central banks and statistical bureaus of Ghana and Nigeria.
TBILL	Treasury bill	Monthly 91-Day Treasury bill rate used as proxy for interest rate.	Websites of central banks of Ghana and Nigeria, and the World Bank.
EXR	Exchange Rate	Monthly nominal exchange rate between local currency and US dollar used as proxy for exchange rate.	Websites of central banks of Ghana and Nigeria, and the World Bank.
RGDP	Real GDP	Monthly real GDP used as proxy for economic growth.	Websites of central banks and statistical bureaus of Ghana and Nigeria.
OIL	Log of Crude oil price	monthly crude oil prices per barrel proxy for world crude oil prices	Websites of central banks of Ghana and Nigeria, and the World Bank.
LSE	LSE all share index	Monthly LSE all share index as a proxy of major stock market indices in the world	London Stock Exchange website
POL	Political Cycle	Political cycle as proxy for political risk	www.un.org/africarenewal en.ikpedia.org/wiki/Elections_by_country

Source: Author's own construct

Tests Used

Several empirical strategies have been employed in literature to estimate relationship between macroeconomic variables and stock market performance. This study employs the Fully Modified Ordinary Least Squares (FM-OLS), Dynamic Ordinary Least Squares (DOLS) as the main models in addition to the Ordinary Least Squares (OLS) technique to ensure that the results for the study are efficient, robust and reliable

The OLS method is widely used to estimate the parameter of a linear regression model. The OLS estimators minimise the sum of the squared errors (a difference between observed values and predicted values). While the OLS is computationally feasible and can be readily used in undertaking any econometric test, it is worthy to note the underlying assumptions of the OLS regression. The OLS regression can produce unreliable results when some points in the data have excessively large or small values for the dependent variable compared to the rest of the data. In addition, the OLS estimates may suffer from errors of serial correlation and heteroskedasticity since the omitted dynamics are captured by the residual so that inference using the normal tables will not be valid.

The FMOLS technique developed by Phillips and Hansen (1990) provides optimal estimates of cointegrating regressions. The method modifies least squares to deal with serial correlation effects and for the endogeneity in the regressors that results from the existence of a cointegrating relationship.

The DOLS improves on OLS by coping with small sample and dynamic sources of bias. In effect the DOLS is a simple approach to constructing an asymptotically efficient estimator that eliminates the feedback in the cointegrating system. Technically speaking, the DOLS involves augmenting the cointegrating regression with lags so that the resulting cointegrating equation error term is orthogonal to the entire history of the stochastic regressor innovations (Stock and Watson, 1993).

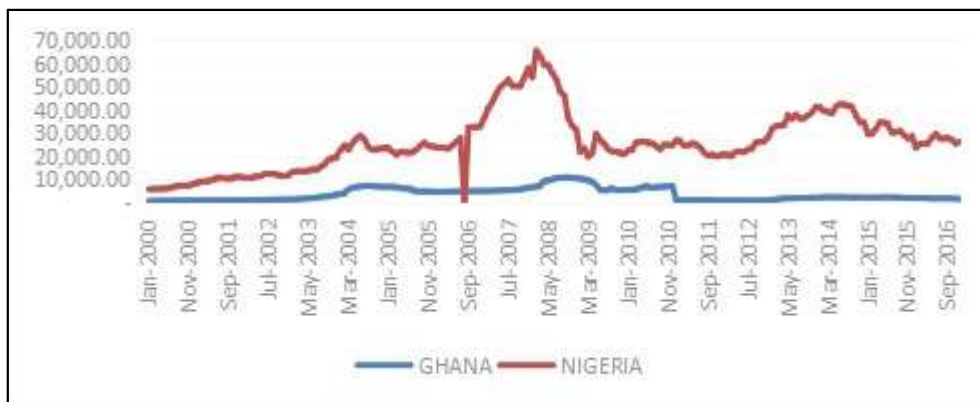
In cases where the sample is small, FMOLS does not under perform as a result of sample size biases. This technique provides a modification of the OLS method and accounts for endogeneity, heteroskedasticity, and serial correlation error of the regression. The FMOLS and the DOLS estimates are therefore more robust in the presence of serial correlation and heteroskedasticity usually associated with time series data (Phillips, 1993).

RESULTS AND DISCUSSION

Trends in SMR, CPI, TBILL and EXR

Stock Market Index (Return)

FIGURE 1
TRENDS IN STOCK MARKET RETURNS (THE GSE-SI AND THE NSEASI) FROM JANUARY 2000 TO DECEMBER 2016

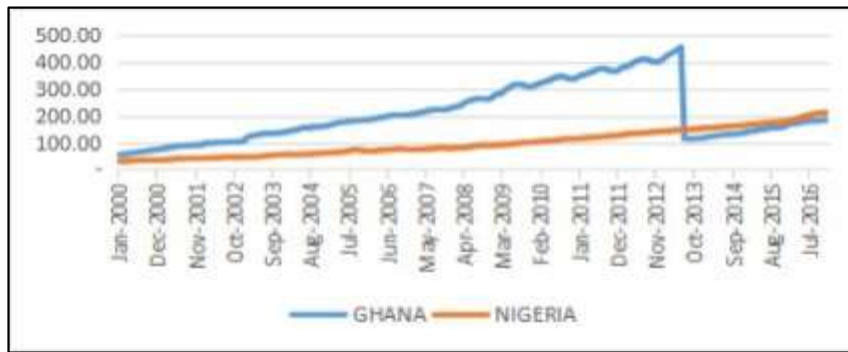


Source: Statistical Departments of Ghana Stock Exchange and Nigeria Stock Exchange

Figure 1 shows the trends in stock market returns (composite index). On the average, stock market returns in Nigeria were higher for most of the period under estimation. More importantly, the stock returns in these two countries have been increasing for the entire period even though stock returns in Nigeria appear to have significant upward movements than those of Ghana. Stock returns have been volatile, with significant structural breaks observed in the stock returns for the two countries. Studying the factors that are likely to cause these changes is worth undertaking.

Consumer Price Index

FIGURE 2
TRENDS IN CONSUMER PRICE INDEX SHOWING VARIATIONS IN CONSUMER PRICE INDEX OF GHANA AND NIGERIA FROM JANUARY 2000 TO DECEMBER 2016



Source: Websites of Bank of Ghana and Central Bank of Nigeria

Figure 2 indicates that CPI (inflation) in both countries on average increased over the entire period even though the CPI for Ghana is steeper as compared to that of Nigeria. The sharp fall of CPI for Ghana was as a result of rebasing of the CPI in May 2013.

Treasury Bill

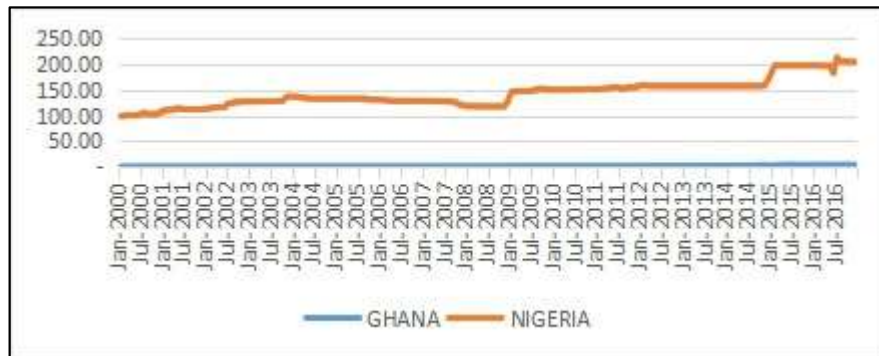
FIGURE 3
TRENDS IN 91-DAY TREASURY BILL (JANUARY 2000-DECEMBER 2016)



Source: Websites of Bank of Ghana and Central Bank of Nigeria

Treasury bill rates for both countries reveal some structural breaks and volatile features (Figure 3). This will undoubtedly affect the performance of stock markets of these countries. Again, the high Treasury bill rates in addition to their volatile nature especially are likely to have adverse effects on the performance of the stock markets of the two West African countries.

FIGURE 4
TRENDS IN EXCHANGE RATE BETWEEN DOMESTIC CURRENCIES (THE GHANA CEDI AND NIGERIA NAIRA) AND THE US DOLLAR FROM JANUARY 2000 TO DECEMBER 2016



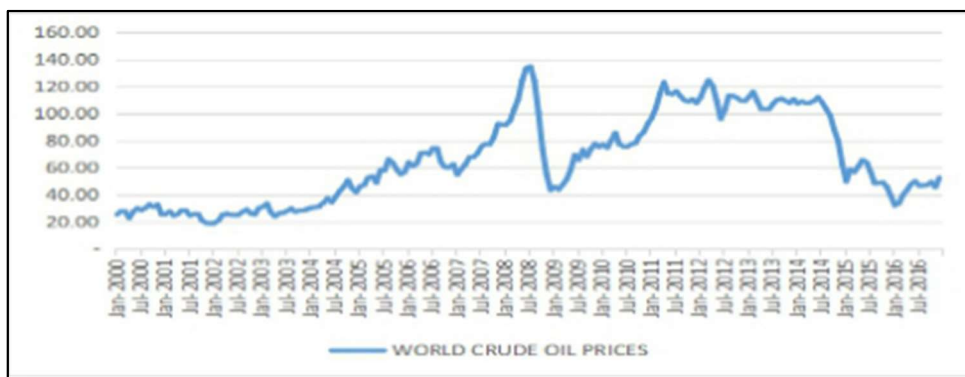
Source: Websites of Bank of Ghana and Central Bank of Nigeria

Exchange rates between the domestic currency and the US dollar increased gently but steadily over the seventeen year period with some few structural breaks for those of Nigeria as shown in Figure 4. The trend for Nigeria depicts a more than 100% increase in exchange rate over the seventeen year period. It is imperative to state that the low exchange rate between the Ghana cedi and the US dollar was as a result of re-denomination of the cedi in 2007 that erased four zeroes. Generally, the Ghana cedi and Nigeria naira depreciated against the US dollar over the seventeen-year period studied (Figure 4).

International Crude Oil Prices

International crude oil prices over the seventeen year period generally increased over the period with some breaks (Figure 5). The period experienced increase in crude oil prices. It is expected that the changes in international crude oil prices will have effect on stock market performance of the two West African countries.

FIGURE 5
TRENDS IN INTERNATIONAL CRUDE OIL PRICES SHOWING CHANGES IN INTERNATIONAL CRUDE OIL PRICES FROM JANUARY 2000 TO DECEMBER 2016



Source: World Bank Website

Descriptive Statistics

TABLE 2
DESCRIPTIVE STATISTICS (GHANA)

Descriptive coefficients of the measures of central tendency and measures of variability that summarise the data set for Ghana.

	LN_SMR	TBILL	EXR	POL	LNRGDP	LN_CPI	LN_OIL	LN_LSE
Mean	7.87	21.51	1.56	0.16	24.13	5.21	4.04	7.95
Median	7.72	22.77	1.04	0	24.1	5.19	4.11	7.99
Maximum	9.3	47	4.19	1	24.6	7.25	4.9	8.26
Minimum	6.61	9.13	0.37	0	23.64	4.02	2.92	7.45
Std. Dev.	0.82	9.3	1.02	0.37	0.32	0.54	0.55	0.19
Skewness	0.06	0.78	1.34	1.88	0.07	0.11	-0.26	-0.57
Kurtosis	1.6	3.29	3.57	4.53	1.56	2.91	1.82	2.51
Jarque-Bera	16.67	21.05	63.76	139.28	17.7	0.5	14.08	13.06
Probability	0	0	0	0	0	0.78	0	0
Sum	1598.29	4366.87	315.71	32	4898.03	1057.73	821.06	1613.81
Sum Sq. Dev.	135.2	17488.84	209.09	26.96	20.73	59.07	60.08	7.44
Observations	203	203	203	203	203	203	203	203

Source: Author's own construct

TABLE 3
DESCRIPTIVE STATISTIC (NIGERIA)

Descriptive coefficients of the measures of central tendency and measures of variability that summarize the data set for Nigeria.

	LN_SMR	LNRGDP	LN_CPI	LN_LSE	LN_OIL	POL	TBILL	EXR
Mean	10.05	24.13	4.44	7.95	4.04	0.14	10.88	146.12
Median	10.12	24.09	4.46	7.99	4.10	0.00	10.78	133.37
Maximum	11.09	24.60	5.36	8.26	4.90	1.00	24.50	312.50
Minimum	8.66	23.63	3.38	7.45	2.92	0.00	1.04	98.78
Std. Dev.	0.53	0.32	0.54	0.19	0.55	0.34	4.79	37.93
Skewness	-0.67	0.08	-0.17	-0.58	-0.25	2.11	0.15	2.45
Kurtosis	3.15	1.56	1.92	2.52	1.81	5.44	2.63	10.69
Jarque-Bera	15.48	17.78	10.89	13.19	14.27	201.93	1.87	706.26
Probability	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.00
Sum	2050.43	4921.66	906.43	1621.81	824.29	28.00	2219.78	29808.63
Sum Sq. Dev.	57.72	20.98	59.68	7.45	60.74	24.16	4666.88	292058.20
Observations	204	204	204	204	204	204	204	204

Source: Author's own construct

The descriptive statistics indicates that the values were not normally distributed around the mean (Table 2 and Table 3). All variables exhibit a positive mean. No randomness was found in the data. This indicates that aggregate stock prices (all share index) and macroeconomic variables selected for the study were all

sensitive to periodic changes and speculations. An individual investor could therefore take advantage of the emergence of arbitrage and earn a significant higher return from the stock markets studied. This indicates inefficiency of the Ghanaian and Nigerian stock markets.

TBILL is reported to be most volatile for Ghana and EXR for Nigeria reporting standard deviation figures of 9.30 and 37.93 respectively. The descriptive statistics shows that the values are not normally distributed around its mean and variance.

All the variables for both countries are asymmetrical. The positive skewness results for most variables indicate that deviation of the distribution from symmetry is positive, except LSE and OIL for Ghana and, SMR, CPI, OIL and LSE for Nigeria.

Kurtosis values for all variables for the two countries deviate from 3. This indicates that the data is not normally distributed. The statistical implication is that the null hypothesis was rejected and the alternate hypothesis was accepted as a result of the residuals not being normally distributed. Based on the Jarque-Bera statistics and p-values the normality assumption is rejected at 5 percent level of significance for all variables.

Correlation Analysis

The correlation analysis was used as a starting point to test the degree of association between the independent and the dependant variable, and also to determine if there is the presence of multicollinearity. A suggested rule of thumb is that if correlation between two explanatory variables is very high in excess of 0.8, multicollinearity may pose serious estimation problems. The original model showed a correlation coefficient of more than 0.8 between inflation (CPI) and broad money supply (M₂). M₂ was therefore excluded from the final estimated model.

The correlation between the explanatory variables and stock market returns (dependant variable) are shown in Table 4 and Table 5.

TABLE 4
CORRELATION RESULTS - GHANA

	SMR	EXR	CPI	TBILL	RGDP	POL	OIL	LSE
SMR	1							
	204							
EXR	-0.1352	1						
	202	204						
CPI	-0.0840	0.0812	1					
	204	204	204					
TBILL	-0.4967*	-0.0307	-0.4058*	1				
	204	204	204	204				
RGDP	0.0256	0.8591*	0.4266*	-0.3225*	1			
	204	204	204	204	204			
POL	0.0181	-0.0093	0.1414*	0.2101*	-0.0292	1		
	204	204	204	204	204	204		
OIL	0.2451*	0.2883*	0.6051*	-0.6091*	0.6984*	-0.0574	1	
	204	204	204	204	204	204	204	
LSE	-0.1788*	0.6137*	0.0939	-0.1668*	0.6484*	-0.0705	0.5000*	1
	204	204	204	204	204	204	204	204

Source: Author's own construct using Eviews 9

TABLE 5
CORRELATION MATRIX - NIGERIA

	SMR	EXR	RGDP	CPI	TBILL	LSE	LSE	POL
SMR	1							
	204							
EXR	-0.3250*	1						
	204	204						
RGDP	0.6230*	0.7424*	1					
	204	204	204					
CPI	0.6883*	0.7695*	0.7871*	1				
	204	204	204	204				
TBILL	-0.5841*	0.1723*	0.4113*	0.4824*	1			
	204	204	204	204	204			
LSE	0.4215*	0.4704*	0.6484*	0.6121*	0.2160*	1		
	204	204	204	204	204	204		
OIL	0.7406*	0.2218*	0.6948*	0.7008*	0.5389*	0.5000*	1	
	204	204	204	204	204	204	204	
POL	0.1064	0.0508	0.0635	0.0538	-0.0598	0.044	0.0222	1
	204	204	204	204	204	204	204	204

Source: Source: Author's own construct using Eviews 9

The correlation results indicate that stock market return is negatively and significantly correlated with TBILL and EXE for both markets. The negative link between TBILL and SMR is not surprising since TBILL have over the years served as an alternative investment sector to stocks in both countries. The results depict that a positive co-movement (relationship) exists between LSE and NSE. Surprisingly, the relationship between LSE and GSE is negative. The negative correlation between CPI and SMR for Ghana is equally not surprising. The CPI however correlates positively with SMR for Ghana.

The results reported positive correlations between RGDP, OIL, POL and SMR. This positive RGDP results imply that the market indexes for Ghana and Nigeria grow with their respective economies. The positive correlation between SMR and POL is surprising for Nigeria. This implies the political atmosphere in Ghana and Nigeria is conducive for stock market performance. There seem to be some high correlations between some explanatory variables for both countries.

Unit Root Test Results

The study examined the time series properties of the variables used by the use of unit root test to investigate the existence of a stochastic trend in the regression model used. In addition, the unit root test helps to avoid spurious regression, which is brought about by the regression of non-stationary variables.

TABLE 6
AUGMENTED DICKEY-FULLER AND PHILIPS PERRON UNIT ROOT TEST
RESULTS – GHANA

Variables	Lag	ADF T-statistics	Test critical values @ 5%	Test critical values @ 1%	PP T-statistics	Test critical values @ 5%	Test critical values @ 1%
CPI	2	13.0874	2.87582	3.4630(0.000)	43.5815	2.87568	3.4627(0.0001)
EXC	0	19.7911	2.87568	3.4627(0.000)	19.7911	2.87568	3.4627(0.000)
LSE	0	143586	2.87568	3.4627(0.000)	14.4156	2.87568	3.4627(0.000)
OIL	0	15.2266	2.87568	3.4627(0.000)	15.1918	2.87568	3.4627(0.000)
POL	0	14.4787*	2.87568	3.4627(0.000)	14.1499*	2.87568	3.4627(0.000)
RGDP	0	14.1479*	2.87575	3.4629(0.000)	14.1479*	2.87575	3.4629(0.000)
SMR	0	12.0710	2.87568	3.4627(0.000)	12.2077	2.87568	3.4627(0.000)
SMR-1	0	12.0354	2.87575	3.4629(0.000)	12.1722	2.87575	3.4629(0.000)
TBILL	0	9.30984	2.87568	3.4627(0.000)	9.53629	2.87568	3.4627(0.000)

NB: All variables except RGDP and POL are stationary at first difference; The probability of it having a unit root are in parenthesis.

TABLE 7
AUGMENTED DICKEY-FULLER AND PHILIPS PERRON UNIT ROOT TEST
RESULTS – NIGERIA

Variables	Lag	ADF T-statistics	Test critical values @ 5%	Test critical values @ 1%	PP T-statistics	Test critical values @ 5%	Test critical values @ 1%
CPI	0	9.28215	2.87568	3.4627(0.000)	9.29194	2.87568	3.4627(0.0001)
EXC	1	9.93974	2.87575	3.4629(0.000)	10.1279	2.87568	3.4627(0.000)
LSE	0	14.3586	2.87568	3.4627(0.000)	14.4156	2.87568	3.4627(0.000)
OIL	0	15.2266	2.87568	3.4627(0.000)	15.1918	2.87568	3.4627(0.000)
PC	6	8.97615	2.87612	3.4637(0.000)	14.1421	2.87568	3.4627(0.000)
RGDP	2	4.94215	2.87582	3.4630(0.000)	11.5534	2.87568	3.4627(0.000)
SMR	2	5.27654	2.87620	3.4639(0.000)	12.9658	2.87589	3.4632(0.000)
SMR-1	2	5.24068	2.87627	3.4641(0.000)	12.8965	2.87597	3.4634(0.000)
TBILL	0	11.6861	2.87568	3.4627(0.000)	11.6590	2.87568	3.4627(0.000)

NB: All variables are stationary at first difference; the probability of it having a unit root are in parenthesis.

The Augmented Dickey Fuller (ADF) and Philips Perron (PP) tests were used to ensure stationarity of variables (Nyamongo and Misati, 2010). Hence the study conducted the ADF and PP test with constant intercept only scenario and assumed the same null hypothesis of no unit root in the data series. The unit root test results indicated that all variables were non-stationary at levels but attained stationarity at first levels except POL and RGDP which attained stationarity at levels for Ghana (Table 6). All variables were stationary at first difference for Nigeria (Table 7).

Cointegration Test Results

The result of the Johansen cointegration test based on the trace and maximum eigenvalue tests are shown in Table 8 and Table 9. The test determines the existence of a long-run relationship between the dependent and explanatory variables in Ghana and Nigeria. The results suggest at least one cointegration equation, which therefore provides evidence of a long run relationship among variables.

The cointegration analysis starts with the null hypothesis of no cointegration and concludes on the existence of at least one (1) cointegrating vector if the null hypothesis is rejected at 5% significance level. Table 8 suggests at most 1 cointegrating equation based on trace test for Ghana and Table 9 gives at most 2 cointegrating equations based on trace test and two cointegrating equations based on maximum eigenvalue for Nigeria, thus showing evidence of a long-run relationship among variables for both countries.

The cointegration results establish that a long-run relationship exists between macroeconomic/political variables and the stock market returns for Ghana and Nigeria.

**TABLE 8
COINTEGRATION TEST RESULTS - GHANA**

Unrestricted cointegration Rank Test Results (Trace)

Hypothesised	Trace	0.05 Critical		
No. of CE(s)	Eigenvalue	Statistic	Value	Prob.**
None *	0.237772	186.1508	159.5297	0.0008
At most 1 *	0.192726	132.1205	125.6154	0.0189
At most 2	0.153019	89.51605	95.75366	0.1244

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Max.Eigenvalue)

Hypothesised	Max-Eigen	0.05 Critical		
No. of CE(s)	Eigenvalue	Statistic	Value	Prob.**
None *	0.237772	54.03036	52.36261	0.0334
At most 1	0.192726	42.60443	46.23142	0.1165
At most 2	0.153019	33.04937	40.07757	0.2490

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

TABLE 9
COINTEGRATION TEST RESULTS - NIGERIA

Unrestricted Cointegration Rank Test (Trace)

Hypothesised	Trace	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.202633	176.5629	143.6691	0.0002
At most 1 *	0.199125	131.5013	111.7805	0.0016
At most 2 *	0.169436	87.31327	83.93712	0.0279
At most 3	0.125258	50.36893	60.06141	0.2506

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Max. Eigenvalue)

Hypothesised	Max-Eigen	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.202633	45.06156	48.87720	0.0197
At most 1 *	0.199125	44.18806	42.77219	0.0346
At most 2 *	0.169436	36.94434	36.63019	0.0459
At most 3	0.125258	26.63142	30.43961	0.1387

Max-eigenvalue test indicates no cointegration at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

OLS, FMOLS and DOLS Results

The OLS, FMOLS and DOLS results for the two countries are presented in Table 10 and Table 11.

TABLE 10
OLS, FMOLS AND DOLS RESULTS - GHANA

VARIABLES	(1)	(2)	(3)
	OLS	FMOLS	DOLS
Log SMR-1	0.9572*** (0.0092)	0.8853*** (0.0140)	0.9931*** (0.0102)
Log CPI	-0.8097*** (0.175)	-1.0701*** (0.298)	-0.9529** (0.386)
Log TBILL	-0.4857*** (0.165)	-0.7821** (0.337)	-0.6558** (0.488)
Log EXR	-3.3467*** (0.291)	-4.1972*** (0.577)	-3.7980*** (0.765)
Log RGDP	4.4988*** (0.356)	5.5566*** (0.693)	4.9905*** (1.037)
Log OIL	-1.0425*** (0.151)	-1.2598*** (0.342)	-1.2201** (0.485)
Log LSE	-0.5114** (0.249)	-0.3652 (0.657)	-0.3653 (0.850)
POL	0.1263	0.2391	0.1632

	(0.091)	(0.222)	(0.334)
Constant	-24.0323***	-33.9270***	-28.8140**
	(4.289)	(9.408)	(14.057)
Observations	204	203	201
R-squared	0.963	0.874	0.978

Dep Variables: Log SMR
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE 11
OLS, FMOLS AND DOLS RESULTS – NIGERIA

VARIABLES	(1) OLS	(2) FMOLS	(3) DOLS
Log SMR-1	0.9439*** (0.0081)	0.8732*** (0.0102)	0.9872*** (0.0124)
Log CPI	3.9598*** (0.290)	4.4714*** (0.647)	4.2148*** (0.760)
Log TBILL	-0.0829*** (0.030)	-0.1192 (0.083)	-0.0735 (0.103)
Log EXR	-2.5746*** (0.411)	-2.5851*** (0.903)	-3.0854** (1.215)
Log RGDP	4.4743*** (0.395)	5.2290*** (0.898)	4.5781*** (1.012)
Log OIL	0.1675** (0.068)	0.1609 (0.160)	0.1356 (0.232)
Log LSE	0.0509 (0.115)	-0.0210 (0.290)	-0.0794 (0.339)
POL	0.2539*** (0.049)	0.2485** (0.116)	0.3641*** (0.141)
Constant	111.8293*** (8.428)	128.3370*** (19.117)	117.0970*** (21.078)
Observations	203	202	200
R-squared	0.939	0.796	0.985

Dep Variables: Log SMR
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The OLS, FMOLS and DOLS results report of very high variations in the stock market returns explained jointly by the explanatory variables. Nigeria registered a higher R-square figure for both DOLS (98.5%) while Ghana recorded a higher OLS and FMOLS of 0.963 and 0.874 respectively). The high R-square values indicate that the variables explain greater portions of changes in stock market returns of the two West African countries.

The results depict that one of the important drivers of stock market return in Ghana and Nigeria is its lag. The lag of stock return exerts positive and statistically significant impact on the stock returns for both countries. This finding is consistent with that of Er and Vuran, (2012) and Osisanwo and Atanda (2012).

The consumer price index exerts a statistically and significantly positive impact on stock market returns for Nigeria. This empirical finding is consistent with that of some previous studies (Choudhry, 2001; Maysami et al., 2004). Their rationale for this pattern is related to the adequacy of hedging role of stocks against inflation. That is, Nigerian stocks can be used as a hedge against inflation, since the positive regression coefficient implies a higher expected return is required for higher inflation rate. The impact of

consumer price index on stock market returns of Ghana is statistically and significantly negative. The negative link between CPI and stock market return of Ghana may be as a result of relatively high inflation figures in Ghana over the years. This result supports a significant number of empirical evidences which also reported a negative link between inflation and stock market returns (Kyereboah-Coleman and Agyire-Tetteh, 2008; Sohail and Hussain, 2009; Ahmed and Mustafa, 2012).

Both Ghana and Nigeria record negative and statistically significant exchange rate effect on stock market returns (Table 6.10.1 - Table 6.10.2). This implies the depreciation of the Ghana cedi and the Nigeria naira leads to a reduction in the stock market indices of these two countries.

Similarly, the results indicate a negative effect of interest rates (TBILLS) on stock market index for both countries with the Ghana results being statistically significant for all three frameworks employed. These results imply that treasury bill represents alternative investment sector to stocks especially for Ghana. A rise in interest rates makes the money market a more rewarding investment sector and therefore investors tend to invest more funds in money market securities mainly treasury bills and less in stocks. A fall in stock prices as a result of a decrease in demand for stocks is ineluctable. This phenomenon has been the bane of most economies of SSA as various governments rely on treasury bills to raise domestic funds to finance development projects. This practice usually creates an upward pressure on the Treasury bill rate. The performance of the stock exchanges is adversely affected as a result.

The OLS, FMOLS and DOLS results report of positive and statistically significant RGDP effect on stock market returns in both countries. This result is consistent with the findings of Chandra (2004), and Daferighe and Aje (2009). This implies that the growth of both economies has a positive effect on the performance of the stock markets of the two West African countries.

OIL is negatively related to SMR in Ghana. The result which is worth noting is statistically significant from both the FMOLS and DOLS estimates. This result is not unexpected since Ghana is a net importer of oil. For net oil importing countries, oil price is hypothesised to impact stock returns negatively (Nandha and Faff, 2008). In this respect, increases in oil prices would cause a rise in production costs and a subsequent fall in aggregate economic activity. This would ultimately create a reduction in stock market returns. Oil however is positively related to stock market returns in Nigeria. The finding for Nigeria seem to support the findings of Nandha and Faff (2008) who established that stock markets in exporting countries respond positively to increases in crude oil prices while that of importing countries are likely to be negative.

London Stock Exchange all share index seems to be one of the revelations of this study. LSE is positively related to the stock market returns in Nigeria but negatively related to stock market returns in Ghana. The positive results for Nigeria tend to indicate that there is a common trend or factor that is driving Nigeria Stock Exchange (NSE) and LSE in the same direction. The results for Ghana implies that investors can take advantage of this relationship to create an international portfolio of stocks.

The FMOLS and DOLS results depict that political climate in Ghana and Nigeria do not pose threats to the performance of the stock markets in these countries. The positive results for Nigeria is rather surprising. The results seem to portray that severe conflicts between members of political parties during general elections do not have adverse effects on the Nigerian stock market performance.

The results from the three estimation frameworks employed for the study therefore depict that the explanatory variables selected for the study have effects on the stock market indices of Ghana and Nigeria.

CONCLUSION AND IMPLICATIONS

The main objective of this study is to empirically examine the effect of variables, mainly macroeconomic in nature, on macroeconomic returns. The findings of this study research buttress the assertions raised by previous scholars that macroeconomic and political factors predict stock market returns. The revelation of the study is the effect of political cycle and London Stock Exchange all share index on the composite index of the two West African countries selected for the study. Investors can take advantage of this finding to guide their investment decisions. The findings also buttress the findings of earlier studies such as Adjasi et al (2008) and Kuwornu (2012) that the three dominant variables of inflation, interest rates and exchange rates influence stock market returns.

The principal motivation of this research is to enable policy makers appreciate the mounting need to formulate appropriate monetary policies that will help control macroeconomic variables in order facilitate the development and performance of the stock markets of the two countries. Governments' dependence on treasury bill to mobilise funds for development purposes should not result in a fall in demand for stocks and the crowding out of the private sector from the financial market, mainly the banking sector. Thus, policy should constantly seek to develop and implement a sound and stable macroeconomic and political environment that will attract institutional and individual investors into the capital market and promote stock market development to spur economic growth. Policies, regulations and laws that forbid provocative utterances and political violence especially during periods before, during and after general elections should be enforced. This will facilitate acquisition of equity capital and listings which will aid performance of the GSE and NSE and economic growth of the two countries in general.

Again, it is imperative for managers of the exchanges to devise appropriate strategies to make the stock markets attractive to investors and also develop innovative products to promote stock market development. The establishment of alternative stock exchange such as the Ghana Alternative Market (GAX) and the Alternative Securities Market (ASeM) of Nigeria to get small and medium businesses will help business firms especially the small and medium firms to obtain long term funds and get listed to enhance the liquidity of their shares are laudable ideas. It is imperative for managers of the two stock markets to institute prudent measures to enhance public knowledge, interest and confidence in the operations of the stock market. Investors and entrepreneurs who have much knowledge about the capital market are more likely to participate in the stock market than those with little or no knowledge. As more people invest in stocks, the stock markets in Ghana and Nigeria will become more liquid, and ultimately result in increase in composite indexes.

This research, just like any other social research, is not without limitations. The unavailability of GDP on a monthly basis is likely to affect the empirical results of the study. The researcher had to use the interpolation method to transform RGDP data into monthly data to aid analysis since GDP is computed in Ghana and Nigeria on quarterly basis. The monthly calculated figures for real GDP is perceived to be more reliable than the industrial production index which has been employed by some scholars as an alternative proxy for economic activity.

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