EFFECT OF FISCAL POLICY ON STOCK MARKET PERFORMANCE IN NIGERIA

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Abstract

The aim of this study was to investigate the effect of fiscal policy on stock market performance in Nigeria. The specific objectives were to investigate the effect of company income tax on the stock market performance in Nigeria; to find out the effect of petroleum profit tax on the stock market performance in Nigeria; to investigate the effect of government capital expenditure on stock market performance in Nigeria; and to determine the effect of government recurrent expenditure on the stock market performance in Nigeria. The study adopted *ex post facto* research design. The data were analyzed using a number of empirical tests. The study adopted ex post facto research design and employed times series data sourced from the CBN statistical bulletin and the Nigeria Stock exchange group. Evidence of longrun relationship was found among the model variables through the Johansen test, and a fast speed of adjustment at 10.01% annually. The major findings of the study are: government capital expenditure has significant positive effect on the stock market performance in Nigeria; government recurrent expenditure has significant positive effect on the stock market performance in Nigeria; company income tax had significant negative effect on the stock market performance in Nigeria; and petroleum profit tax has significant negative effect on the stock market performance in Nigeria. The study concluded that that fiscal policy had significant but mixed effect on the stock market performance in Nigeria for the period reviewed. Based on the findings, the study recommended that: the government should increase the capital component of its spending and direct it towards provision of critical infrastructures; this will further boost investors' confidence in the stock market and the economy at large; the government may wish to increase or sustain the current rate of the recurrent component of its spending; increasing it will boost consumption demand and improve stock market performance; the policymakers should design a strategy toward sustaining or reviewing down the company income tax due to evidence of negative shock on the stock market; and the petroleum profit tax should be increase only for the aim of mitigating the environmental risks that follow it operations and which affect stock market outcomes.

Keywords: Fiscal policy, tax, government expenditure, stock market

Introduction

Nigerian stock market is fast becoming one of the most emerging stock markets in Africa. However, compared with developed countries, such as the UK and the USA, Nigeria is still in a period of economic transition. The Nigerian stock markets are not fully mature yet and are still restricted, with interventions from various political and economic factors. Therefore the policy transmission mechanisms suitable to mature markets may not be appropriate for the Nigerian stock markets. To investigate the effect of fiscal policy shocks on stock markets will help to enrich previous research in this field and also stand as a point of reference for other related research on this area as pertain to developing countries.

Achieving sustainability in stock market returns has become a weighty issue in contemporary economic management. Global stock market performance is considered to be one of the most serious issues confronting all economies at present. The cause of the stock market volatility is from different sources, and ranges from the fiscal policies (particularly taxation) targeting of certain economic sectors and

foreign investors. The fiscal targeting for instance, relates to the taxation of energy related and oil and gas firms and investments which are significant participants in the stock market. The available literature on environmental taxation holds that such tax policies targeted at oil and gas sector for example is aimed at remediating the effect of carbon emission on the environment. Examples of such literature are Kling, Volz, Victor Murinde and Ayas (2021), and also European Systemic Risk Board (2020).

The performance of the stock of listed companies has grown 21% per year over the last three years (NSE, 2023).Revenues for these companies have been growing by about 20% per year.This means that more sales are being generated by these companies overall, and subsequently their profits are increasing too. The gains have been driven by the positive earnings from some companies as well as the reforms in both the fiscal policies which have helped in attracting foreign investors into the market.Also the performance was partly attributed to gains recorded by the blue chip companies across the sub-sectors.Another stock market gauge, the NGX All Share Index, ASIhas also recorded significant growth, closing the second quarter of 2023 60,968.27 points (NSE, 2023).

Stock market performance at the aggregate level may be caused by a number of factors acting together; therefore a composite consideration of some of these factors is desirable as against using a single measure. For instance, government fiscal policies (especially green taxation), upward movement in exchange rate drives the general price level because of its effect on the cost of production, and this instability may result in reduced funds to private sector by banks because of the perceived risk, and this may lead to variations in trading activities and ultimately fluctuations in prices at the exchange. The need arises therefore, to combine macroeconomic variables with liquidity measures to address stock market volatility in Africa.

Fiscal policy refers to the use of fiscal instruments (i.e. government spending and taxation) in economic policy objectives. Such policies as is the case in Nigeria include company income tax, petroleum profit tax, capital and recurrent expenditures. The relation and response from fiscal policy variables to stock market performance may come through the channel of fiscal actions such as the imposition of certain tax components.

Theoretical and empirical linkage on the effect of fiscal policy on the stock market performance has been provided by prior studies. Models have been developed to assess the effect of taxation on stock market volatility. The models projects stock market returns as a function of fiscal policy variables such as company income tax, petroleum profit tax, government capital expenditure and recurrent expenditures. Stock market prices react to tax schemes (Carattini & Sen, 2019). This flows through the share price of these stocks when a tax component is introduced. For example, high taxes oncarbon firms such as energy and utility companies would see their share prices drop relative to low carbon companies. But if low carbon taxes are introduced today and allowed to increase over time, the price reaction is expected to be moderate and not too extreme. A high carbon tax scheme pulls down the share prices of carbon intensive companies.

Statement of the Problem

The stock market of developing countries (Nigeria in particular) is considered to be extremely volatile and poor; and are likely to be worst hit by the negative impact of climate change, considering their high level of exposure and vulnerability and limited means to mitigate and recover from climate-related catastrophe (Feyen, Utz, Huertas, Bogdan & Moon, 2020). Consequently, this will hinder the ability of

the stock market to play its role of providing strategic partnership that enhances the achievements of global poverty reduction and the progress of attaining sustainable development goals.

High taxes on firms listed on the stock market (especially companies regarded as high carbon emitters) have been projected to see their share prices drop. Such drop in prices will further heighten investors growing concern regarding on the impacts on their investment decision making. For instance, energy companies in Nigeria have been on the decrease due to unsustainable tax scheme which hampers business performance and consequently produce significant impacts on the stock market performances. Some oil and gas firms avoid or evade tax. These companies that avoid or evade tax argue that the tax schemes such as petroleum profit tax and the selective company income tax have a huge impact on their profitability due to the high tax rate charged on assessable profit. Ilaboya and Ofiafor (2020), opines that the increase in tax evasion by oil and carbon related firms is anchored on their argument that the taxes hampers their performance at the stock markets.

Unfortunately, in Nigeria the scope of financial stability and stock return volatility is increasing, there is at the present dearth of satisfactorily and reliable information about the risks of market participants resulting from climate change risk disclosure. Most available studies show conflicting results. To the knowledge of this study, there is scanty local (country case) empirical evidence on the effect of fiscal policy on stock market performance in Nigeria. Such situation means that investment decisions are hampered and the stock market made more volatile as investors increase speculation. And anxieties increase especially relating to stock market performances in Nigeria with respect to expected direction of government fiscal policies on real sector activities. Hence, the goal of this study is to investigate the effect of fiscal policy on stock market performance in Nigeria.

Objectives of the Study

The broad objective of the study is to investigate the effect of fiscal policy on stock market performance in Nigeria. The specific objectives are:

1. To investigate the effect of company income tax on the stock market performance in Nigeria
2. To find out the effect of petroleum profit tax on the stock market performance in Nigeria
3. To investigate the effect of government capital expenditure on stock market performance in Nigeria
4. To determine the effect of government recurrent expenditure on the stock market performance in Nigeria

Literature Review

Fiscal Policy

The term fiscal policy has conventionally been associated with the use of taxation and public expenditure to influence the level of economic activities. Fiscal policy deals with government deliberate actions in spending money and levying taxes with a view to influencing macroeconomic variables in a desired direction. This includes sustainable economic growth, high employment creation and low inflation (Microsoft Corporation, 2004). Thus, fiscal policy aims at stabilizing the economy. Increases in

government spending or a reduction in taxes tend to pull the economy out of a recession; while reduced spending or increased taxes slow down a boom (Dornbusch & Fischer, 1990). Fiscal policy involves the use of government spending, taxation and borrowing to influence the pattern of economic activities and also the level and growth of aggregate demand, output and employment. Fiscal policy entails government's management of the economy through the manipulation of its income and spending power to achieve certain desired macroeconomic objectives (goals) amongst which is economic growth (Medee & Nembee, 2011). Government interventions in economic activities are basically in the form of controls of selected areas/sectors of the economy (including the stock market). These controls differ, and depend on the specific needs or purpose the government desires to achieve. On the premise above, relationship could be established between fiscal policy operation and the performance of the stock market is supported by Akpakpan's view as expressed in Wilson (2002) that development is defined in terms of improvements in the general welfare of the society, usually manifested in the desirable changes in the various as pacts of life of the society". By recognizing improvement in education, government and domestic service as factors that drive economic development, it can be reason that fiscal policy operations (government activity) tends towards economic development.

Tax

Tax is defined as a financial charge or levy imposed upon an individual or legal entity by a State or a legal entity of a State; it is a pecuniary burden laid upon individuals or property to support government expenditure. It also defined tax as a monetary charge imposed by the Government on persons, entities, transactions or properties to yield revenue. It went further to state that tax is the enforced proportional contributions from persons and property, levied by the State by virtue of its sovereignty for the support of Government and the public needs (National Tax Policy, 2013). According to Musgrave (2004), tax plays an important role in Nigeria society and it is a force for economic development in the country, from the pre-colonial to the post-colonial eras. It is by far the most significant sources of revenue for modern government; hence, the recent call for increase in taxation.

Capital Expenditure

The government budget is used to allocate resources to strategic priorities and to prevent misallocation of resources. It is also used to ensure macroeconomic stability and managerial efficiency. As a fundamental instrument of resource mobilization and allocation, the budget facilitates the realization of the vision and goals of the government in a particular fiscal year. Further, the public budget determines that allocation of resources to finance both capital and recurrent expenditures. Capital budgeting comprises two words — capital and budget. It implies setting targets for projects/schemes to ensure maximum profitability. Capital Budget consists of capital expenditure (like expenditure on development of economic and social infrastructures, machinery, health facilities, etc). Capital expenditure is the expenditure on the development of machinery, equipment, building, health facilities, acquisition of assets like land, research & development, education, etc. Examples of capital expenditure: Loans given by the government to states and public-sector undertakings, loans that were taken in the past but are now returned, spending on infrastructure, machinery, land, road, etc

Stock Market and Stock Market Performance

The stock market is defined in terms of several exchanges in which shares of publicly held companies are bought and sold. Such financial activities are conducted through formal exchanges and via over-the-counter (OTC) marketplaces that operate under a defined set of regulations. The stock market is where investors buy and sell shares of companies. Stock market performance is measured using different indexes including the market capitalization. Market Capitalization: Nigeria Stock Exchange data was reported at 54.017 NGNtn in Feb 2023. This records an increase from the previous number of 52.071 NGNtn for Jan 2023. Market Capitalization: Nigeria Stock Exchange data is updated monthly, averaging 17.020 NGNtn from Jun 2008 to Feb 2023, with 177 observations.Investors who buy and sell stocks hope to turn a profit through this movement in stock prices. Investors may also enlist and delist from the market depending on prevailing economic environment and most particularly to policies (such as green taxation) which most of the multinational companies (MNCs) may not find favourable business wise. The empirical literature on the impact offiscal policy and stock market performance has yielded mixed results. Lei & Zhang (2023) investigated the impact of fiscal policy shocks and the interaction of the two policies on stock markets. The study used ordinary least squares technique to analyze the time series data on tax, government spending and stock market capitalization. The study found that fiscal policy has significant, negative contemporaneous relationships with stock market performance.

Faisal, Baban, Duong and Taylor (2022) investigated the relationship between fiscal policy and financial market Utilizing a sample of the top 300 Australian Securities Exchange (ASX)-listed non-financial firms over the period 2008–2019 and ordinary least squares (OLS) regression analysis with fixed effects, the authors found that higher levels of climate change tax policies are related to lower levels of financial distress. Additionally, the significant association between climate change disclosure and financial distress is manifested in firms with low litigation risk. Additional tests that mitigate self-selection and endogeneity, such as propensity score matching (PSM) and the system generalized method of moments (GMM), show that the findings to be robust.

Uhunwangho (2022) examine the volatility of African Stock Markets and the factors influencing it in Africa. The Generalized Autoregressive Research Conditional Heteroscedasticity (GARCH) was used to generate the volatility, and the Generalized Method of Moments was applied on dynamic panel model to examine the factors that account for volatility in Africa. Sixteen (16) African Stock Markets were covered for the period 2013 to 2019. Data was sourced from African Securities Exchanges Association, Bank for International Settlements and World bank development Indicators databases. The study found that macroeconomic instability and financial liquidity variables determine stock market volatility in Africa. Specifically, macroeconomic instability has positive and significant effect on volatility, while stock market liquidity, diaspora remittances, growth in money supply negatively influences stock market volatility. This study recommends that the monetary authorities, particularly Central Banks should inculcate stock market volatility as part of its financial stability goal and apply financial liquidity tools like diaspora remittances, money supply, and stock market liquidity to mitigate it, while ensuring stability in the macro-economy.

Bolton and Kacperczyk (2021) examined the effect of firms' carbon emissions on the cross-sectional pattern of stock returns. The study used the ordinary least square regression analysis (OLS) to estimate the model using time series data. The study found that stock market all share index responded negatively to carbon emission taxes and solid mineral mining taxes but responded positively to the green bond variable. The study recommended a balanced climate change mitigation action by government in area of reviewing the extant carbon tax laws.

Muhahmad, Wasseem and Fahran (2020) investigated the role of corporate dividend policy in determining the volatility in the stock prices in Pakistan. A sample of 73 firms has been selected from Karachi Stock Exchange (KSE) indexed (KSE-100) firms for the period of 2003-2008 and fixed effect and random effect models have been applied on the panel data. The results found that dividend policy has a strong significant relationship with the stock price volatility in KSE. The findings are consistent with the earlier researchers of developing economies that price volatility may be reduced by employing an effect corporate dividend policy (Rashid and Rahman, 2008).

Caby, Ziane and Lamarque (2020) researched the impact of fiscal policy on the financial sector for selected developed and developing countries. Using data on 117 banks from 40 developed and developed countries around the world, the study used ordinary least square regression and multivariate logit analysis to show that country-level and bank-level characteristics are much better predictors of climate change on banks performance. The study found that carbon emission taxes and solid mineral mining taxes were negative and significant on the all share index. Banks want to project themselves as good citizens when they are located in a developed and environmentally friendly country, profitable, less risky, and subject to multiple-listing constraints. However, the picture is unclear when it comes to the implementation of rigorous carbon disclosure.

Theoretical Framework

This theory was propounded by Jevons in 1871. Political economy is the study of production and trades and how it is influence by law, custom and government. Political economy theory has been the most widely used theory to explain why organizations seem to yield to government or public pressure for the disclosure of information about the impact of their operations within and without the communities in which they operate (Liu &Anbumozhi, 2009; Deegan, 2002; Cormier & Gordon, 2001; Gutherie& Parker, 1990; Dowling &Pfeffer, 1975). Political economy theory has been used to explain the disclosure of social and environmental information by corporate organizations (Deegan&Unerman, 2006).

The theory supposes that organizational outcomes (such as stock market performance) could be explained by environmental information (climate change) where law and regulatory framework are applied to achieve certain economic, social and environmental objectives. The basic model of the political economy theory sees production as a function of environmental information. The production performance function of an economic unit could therefore take the form below:

Output = f(L, C, Ei, G)

Where: L = law, C= custom, Ei = environmental information, G = government. In relation to the climate change-stock market nexus, the theory of political economy could therefore appropriately be applied explain how environmental information could trigger directional changes in the performance of the stock market.

Methodology

The research design adopted for this study is the *ex post facto.* This choice of this design is due to its suitability in forecasting time series variables. The processes to be followed will begin with the unit root test of stationarity, followed by the test for co-integration using the Johansen approach and then the ordinary least squares analysis.The data used for the study were sourced from the CBN statistical bulletin, the Nigerian Stock Exchange annual reports, and the Federal Inland Revenue Service (FIRS) annual

reports. The data are time series data on company income tax, petroleum income tax, government capital expenditure, and government recurrent expenditure. The data covers the period 1991-2022.

Model Specification

The empirical model for this study is a modification of the model according to the theory of political economy. The model projects stock market capitalization as a function of fiscal policy variables.

Functionally, the model is specified below:

SMKC = (CIT, PPT, GCX, GRX) … 1

Where:SMKC = stock market capitalization, CIT = company income tax, PPT = petroleum profit tax, GCX = government capital expenditure and GRX = government recurrent expenditure

The linearized (econometric) model is specified thus

$SMKC = \beta 0 + \beta 1CIT + \beta 2PPT + \beta 3GCX + \beta 4GRX + Ut \ldots 2$

Where β1, β2, β3 and β4 are the estimated coefficients of the of the green taxation variables of carbon emission, solid mineral mining taxes, industrial pollution tax and the monetary policy rate

The analytical techniques employed in the study include, the Augmented Dickey Fuller Unit Root test, the Bounds test of long-run relationship and the autoregressive distributed lag model (ARDL) estimation or the system equation estimation of the vector error correction estimates (depending on the outcome of the pre estimation tests), the Breusch-Godfrey test of serial correlation, the CUSUM test of model parameter stability, the Jacque Bera normality test, and the Granger causality test – all using the E-views 10.0 environment.

The study carried out further tests using E-views statistical software in order to establish the reliability and robustness of the thesis findings. Some of these tests carried out will be presented subsequently. The model variables were tested for stationarity using the Augmented Dickey-Fuller Unit root approach which will support the evasion of analysing inconsistent and spurious relationships. Time series variables are stochastic in nature, or simply wander around at random, and exhibit non-stationary tendency, which make future forecasting complex (Mailafia 2014).

Results and Discussions

Descriptive Statistics

The summary of the descriptive statistics from the data set is presented in table 1. From the table, average capitalization at the stock market (SMKC) is about 9323.951 billion naira for the period under review and the fiscal policy determinants (government capital expenditure – GCX, government recurrent expenditure – GRX, company income tax – CIT; and petroleum profit tax – PPT) averaged 704.911 billion naira, 2294.21 billion naira, 370.75 billion naira; and 12216.13 billion naira respectively. These averages (mean values) show that there is high level of influence of fiscal policies on the performance of the stock market inNigerian financial space. Hence, fiscal policy variables do not only influence market decisions but also trigger the aggregate performance metrics of the stock market in terms of annual net capitalization volume.

Table 1: Descriptive Statistics

	SMKC	GCX	GRX	CIT	PPT
Mean	9323.951	704.9097	2294.211	370.7447	12216.13
Std. Dev.	0.143330	0.333983	0.202310	0.409483	0.446212
Skewness	0.310056	0.259454	0.211776	0.486688	0.358107
Kurtosis	3.125234	3.199828	3.691311	2.879931	3.172944
Observations	32	32	32	32	32

Source: Author's computation 2023 (Eviews 10)

The result showed all the stock market performance determinant variables to be positively skewed with coefficient values of 0.31, 0.26, 0.21, 0.49 and 0.36 for government capital expenditure, government recurrent expenditure, company income tax and petroleum profit tax respectively. The statistical result equally indicated that all the variables have a positive kurtosis; while the stock market capitalization, the government capital expenditure, the government recurrent expenditure and the petroleum profit tax were mesokurtic (value greater than 3), the company income tax variable indicated to be playkurtic (value less than 3).

Unit Root Test

Stationarity is important because many useful analytical tools and statistical tests and models rely on it. Unit root tests can be used to determine if trending data should be first differenced or regressed. Moreover, economic and finance theory often suggests the existence of long-run equilibrium relationships among non-stationary time series variables.It usually implies that the statistical properties of a time series (or rather the process generating it) do not change over time. Describing the underlying characteristics of the data collected on model variables are usually pre-estimation tests. The statistical descriptions of the data sets do not sufficiently pass for goodness of fit of the data if the test of stationarity of model variables is omitted. Thus, to confirm the possibility of fitting the data into regression equations for estimation purpose, the study conducted the unit root test of stationarity using the Augmented Dickey-Fuller (ADF) approach; this was followed by the correlation analysis, andthe test for multi-collinearity. The ADF unit root tests were conducted to verify the order of integration of each variable. Table 2 provides the summarized results of the stationarity test; while tables 3 displayed the correlation matrix for the linear relationship test.

Table 2: Summary result of unit root test of stationarity

SERIES	@ LEVELS		@ FIRST DIFFERENCE		ORDER	REMARK
	ADF Stat	**5% critical value**	**ADF Stat**	**5% critical value**	**1(1)**	**Stationary**
SMKC	-0.090817	-3.562882	-5.307081	-3.568379	1(1)	Stationary
GCX	-2.043452	-3.562882	-7.501644	-3.568379	1(1)	Stationary
GRX	-2.225802	-3.562882	-3.926322	-3.568379	1(1)	Stationary
CIT	-3.064042	-3.562882	-5.986774	-3.568379	1(1)	Stationary
PPT	-2.640245	-3.562882	-6.124834	-3.568379	1(1)	Stationary

Source: Researcher's computation 2023 (E-views)

The test for stationarity conducted using the Augmented Dickey Fuller Test (ADF) showedthat all the model variables did not achieve stationarity at levels, the ADF t-stat were less than their 5% critical values, and the p-value greater than (0.05) level of significance (column 2 and 3 of table 4.1). This makes it necessary for a difference testing. Differencing was done when the data set failed to be stationary at level, stationarity is concluded if the ADF statistic is greater than the 5% critical value or if the probability value (P-value) is less than (0.05). The variables were subjected to unit root test at first difference, after which all achieved stationarity. The ADF t-stat became greater than the 5% critical value and the p-values less than (0.05) level of significance (column 4 of table 2). Hence, stationarity and integration was achieved at order 1(1). The results justified the use of Johansen Co-integrated test to determine the long-run relationship among variables.

Correlation test

Correlation test was used to ascertain the strength and magnitude of the relationship between the dependent and independent variables and as a further test to analyse the stock market volatility through the key selected determinant variables (carbon emission tax, solid mineral mining tax, the monetary policy rate and the liquidity ratio), the correlation coefficients tables below portrayed serves to indicate the presence or absence of colinearity between the endogenous variable and exogenous variables. The result of the correlation test is presented in table 6 below.

Table 3: Correlation Matrix

	SMKC	GCX	GRX	CIT	PPT
SMKC	1.000000	0.909576	0.980479	- 0.562466	- 0.511284
GCX	0.909576	1.000000	0.938634	0.679620	0.623042
GRX	0.980479	0.938634	1.000000	0.639229	0.594380
CIT	-0.562466	0.679620	0.639229	1.000000	0.927383
PPT	-0.511284	0.623042	0.594380	0.927383	1.000000

Source: Author's Computation 2023 (Eviews10)

The correlation test result in table 3 above shows the correlation movements of the dependent variable (stock market capitalization) and the independent variables (fiscal policy variables). The relationship appeared to be positive for the stock market volatility and (the government capital and recurrent expenditures). However, it showed negative correlation for the company income and petroleum profit taxes.

Cointegration Test Result of Long-Run Relationship

To test for the long-run relationship between the dependent variable (stock market volatility) and the independent variables (fiscal policy variables), the study adopted the Johansen approach to co-integration test which enabled the researcher to determine whether long run tendency exist among the model variables. This approach became appropriate given that the variables were stationary at first difference and integrated of order 1(1). The result is presented below:

Table 4: Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.946662	169.3033	69.81889	0.0000
At most 1 *	0.807402	81.37038	47.85613	0.0000
At most 2 *	0.494276	31.95588	29.79707	0.0278
At most 3	0.317914	11.50297	15.49471	0.1824
At most 4	0.000832	0.024969	3.841466	0.8744

Trace test indicates 3 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Author's computation 2023 (E-view 10)

The result showed that out of the 5 hypothesized number of cointegration equations, 3 cointegrating equations were identified (None*, At most 1, and At most 2). The statistical result indicated the evidence of long run relationship of the variables at the identified cointegrating equation. The trace statistical value was greater than the 5%critical value (169.3033 > 69.81889 at none*; 81.37038 > 47.85613 At most 1; 31.95588 > 29.79707 At most 2). With this evidence, the study concluded the presence of long run relationship of the model variables.

Vector Error Correction (VECM)

The presence of co-integration between or among variables implies the presence of short-run errors; this therefore presents the need for the Vector Error Correction Mechanism (not ECM because the model used in the study is a multiple regression model). The error correction mechanism smoothen the short-run errors associated with variables which have long run relationship or co-integration properties. The conditions for smoothening effects being that the vector error correction coefficient must be negative, fractional and significant.

Table 5: Vector Error Correction Estimates

Error Correction:	D(SMKC)	D(GCX)	D(GRX)	D(CIT)	D(PPT)
CointEq1	-0.100473	0.007586	0.024631	0.045726	1.016495
	(0.00399)	(0.01388)	(0.01383)	(0.01508)	(0.44711)
	[-2.65246]	[0.54647]	[1.78120]	[3.03138]	[2.27348]

Source: Researcher's computation 2023 (using E-views 10)

The presence of long run relationship provides for short term fluctuations. These fluctuations are straightened out using the error correction mechanism (ECM) to tie the short run and the long run equilibrium relationships. The VECM result presented in table 5 above indicates that all three conditions were fulfilled and it can be said that -0.100473 or 10.05% of the short run errors are corrected each period and it entails a significant speed of adjustment. The conditions for error corrections are satisfied since the coefficient is negative, fractional and significant. This is an indication of a very high speed of adjustment from the short-run to the long-run equilibrium

Estimation Result

Predicting the statistical significance between the endogenous variable (stock market performance) and the exogenous variables (fiscal policy: government capital expenditure, government recurrent expenditure, company income tax, and the petroleum profit tax), the study conducted system equation of the vector error correction estimates which aided in measuring the degree of impact on the predicted variable by the predictor variables. The system equation was adopted (following the order of integration of the variables and the evidenced presence of cointegration and error correction) to critically examine the effect of green taxation policies on the volatility of the stock market in Nigeria.

Table 6: System Equation VECM Regression Result
Dependent Variable: D(SMKC)
Method: Least Squares (Gauss-Newton / Marquardt steps)

	Coefficient	Std. Error	t-Statistic	Prob.
VECM-1	-0.100473	0.153991	-0.652460	0.5228
SMKC-1	0.373882	0.311789	1.199152	0.2469
SMKC-2	-0.426737	0.250831	-1.701289	0.1071
GCX-1	18.98958	2.838500	2.686616	0.0126
GRX-1	2.800005	0.784175	2.739925	0.0094
CIT-1	-3.389000	0.110013	-3.372008	0.0005
PPT-1	-0.788909	0.823602	-2.957877	0.0016
R-squared	0.730194			
Adjusted R-squared	0.715614			
S.E. of regression	0.171602			
F-statistic	4.182565	Durbin-Watson stat		2.351448
Prob(F-statistic)	0.004235			

Author's computation 2023 (E-views 10)

From the system equation regression (table 6), the following statistics are indicated; the coefficient of multiple determination (R^2), f-ratio, the standard error of the regression (SER) and Durbin-Watson (DW) statistics. The R^2 measures the overall goodness of fit of the regression plane; the higher the R^2, the better the goodness of fit. To pass the goodness of fit test, the coefficient of determination must have a value of at least fifty percent. The magnitude of the f-statistics is a test of the significance of the relationship between the dependent variable (stock market performance) and the independent variables (fiscal policy: government capital expenditure, government recurrent expenditure, company income tax, and the petroleum profit tax) taken as a whole, while Durbin-Watson statistics is used to test for the first-order autocorrelation of the random variable. Because multiple regression model was used, the study also included the adjusted R^2 or coefficient of multiple regression.

From the results, the explanatory power of the model as informed by the adjusted R-square is seventy nine percent (0.715614 or 71.56%), and is statistically significant given the high value of the f-statistics (i.e.4.182565, p-value 0.004235). To this end, the model demonstrates a good fit given that approximately 72% of the variation in the dependent variable (stock market performance) is jointly explained by variations in the observed behaviour of the fiscal policy variables. The relatively high adjusted R-square shows that the model fits well. The highly significant f-statistics value of 44.182565 confirms that the high adjusted R-square is not a chance occurrence.

In fitting a regression model to a dataset, the usual interest on how well the regression model "fits" the dataset. Two metrics commonly used to measure goodness-of-fit include R-squared (R2) and the standard error of the regression. The SE represents the average distance that the observed values fall from the regression line, and tells how wrong the regression model is on average using the units of the response variable. Smaller values are better because it indicates that the observations are closer to the fitted line.

According to Investopedia (2023), in determining appropriate range of standard error, roughly 95% of the observation should fall within +/- two standard error of the regression, which is a quick approximation of a 95% prediction interval. From the result (table 6) the estimated standard error of regression is 0.171602, since this value falls within the +/-2 range, it implies that the fiscal policy variables would provide more precise predictions of the stock market performance in Nigeria.

Discussion of Findings

The regression coefficients show that the fiscal policy variables (company income tax – CIT, petroleum profit tax – PPT, government capital expenditure – GCX, and government recurrent expenditure – GRX) indicated significant but mixed effect (+ and -negative) relationship with the predicted variable (stock market performance). From the results obtained, the company income tax variable shocked the stock market capitalization to decrease by 3.39% percent within the period; petroleum profit tax shocked the market capitalization, decreasing by 0.79%. However, the government capital and recurrent expenditures boosted the stock market capitalization by 18.98% and 2.80% respectively.

The outcome agrees with empirical studies that fiscal policy programmes of government has an important implication on the stock market returns in various economies to Policymakers, investors, and other market participants. The result matches those of Lei and Zhang (2023), Faisal, Baban, Duong and Taylor (2022). For example, Lei and Zhang (2022) examined the effect of company income tax on the cross-sectional pattern of stock returns and reporteda negative shock of company income tax on the stock markets. Also Nwaiwu and Oluka (2018) found that tax on companies' income exerted negative significant effect on the stock market translating into high volatility of market performance and outcome..

This study found petroleum profit tax to be negatively significant on the stock market performance in Nigeria, as indicated by the coefficient (-0.788909, and p-value, 0.0016). The financial crisis and global recession of the year 2008 has made a number of governments to raise taxes or to consider ways to raise tax revenue from the petroleum sector. The petroleum profit tax makes up only a part of the overall tax costs under consideration by investors. In general, the international trend is an increase in the overall tax burden on oil companies because governments view oil exploration companies as quite profitable in the light of increased mineral prices.

Stock prices react positively to market-wide fiscal policy-favorable news. The results are robust to different model specifications and across equity markets.Financial markets, especially the stock market, have obtained increasing attention in the world. Fiscal policies especially relating to capital expenditure affects investors' sentiment, and trading behaviours, which ultimately reflects on stock returns. It is noticed that investors are influenced by governments spending behavior relating to the provision of social and economic infrastructures that enable business and generate growth for the companies. For example, the economic losses triggered by deficient economic infrastructures accounts for a significant percentage of economic growth depressants. Some studies, such as Wu (2020) provides evidence that governments attention to road, railway and port infrastructures for instance would affect investors' sentiments, causing them make biased investment and trading decisions in stock market. This phenomenon may be more remarkable due to individual investors are major participants in Nigeria's stock market. Nigeria's stock market is growing, with the market capitalization taking a leap each year which attracts domestic and foreign, institutional and individual investors.

Conclusion and Recommendations

This study investigated the effect of fiscal policy on stock market performance in Nigeria. The stock market performance being the dependent variable was proxy by the stock market capitalization (SMKC), while the fiscal policy was proxy by company income tax (CIT), petroleum profit tax (PPT), government capital expenditure (GCX), and government recurrent expenditure (GRX). The study reviewed relevant literature and found gaps in terms of topic, geography, time and model specification of previous studies. The study adopted *ex post facto* research design and the Vector Error correction model (VECM) to estimate the regression coefficients. From the system equation regression, the major findings of the study are: government capital expenditure has significant positive effect on the stock market performance in Nigeria. (Coefficient – GCX = 18.98958, p-value of 0.0126); government recurrent expenditure has significant positive effect on the stock market performance in Nigeria (coefficient is 2.800005, p-value = 0.0094); company income tax had significant negative effect on the stock market performance in Nigeria, (coefficient - CIT=-3.389000, p-value 0.0005); and petroleum profit tax has significant negative effect on the stock market performance in Nigeria, (coefficient – PPT = -0.788909, p-value = 0.0016). Based on the findings, the study concluded that fiscal policy had significant but mixed effect on the stock market performance in Nigeria for the period reviewed.Based on the findings from this research conducted on the effect of fiscal policy on stock market performance in Nigeria, we therefore recommend the followings; the government should increase the capital component of its spending and direct it towards provision of critical infrastructures; this will further boost investors' confidence in the stock market and the economy at large; the government may wish to increase or sustain the current rate of the recurrent component of its spending; increasing it will boost consumption demand and improve stock market performance; the policymakers should design a strategy toward sustaining or reviewing down the company income tax due to evidence of negative shock on the stock market; and the petroleum profit tax should be increase only for the aim of mitigating the environmental risks that follow it operations and which affect stock market outcomes.

References

Al Breiki, Mariam and Nobanee, Haitham. (2019). The role of financial management in promoting sustainable business practices and development. Available at SSRN: https://ssrn.com/abstract=3472404

Al Hammadi, Tahani and Nobanee, Haitham. (2019). FinTech and sustainability: a mini review. Available SSRN: http://dx.doi.org/10.2139/ssrn.3500873

Al Muhairi, Mariam and Nobanee, Haitham. (2019). Sustainable financial management Available at SSRN: https://ssrn.com/abstract=3472417

Alhadhrami, Ahmed and Nobanee, Haitham.(2019). Sustainability practices and sustainable financial growth. Available at SSRN: https://ssrn.com/abstract=3472413

Almansoori, Alia and Nobanee, Haitham. (2019). How sustainability contributes to shared value creation and firms' value. Available at SSRN: https://ssrn.com/abstract=3472411

Andreoni, V. (2019). Environmental taxes: drivers behind the revenue collected. Journal of cleaner production, 221,17-26.

Arshfor, K. (2021). Stock market volatility and macroeconomic fundamentals.*Review of Economics and Statistics, 95(3), 776-797*

Bockay, B., Hales, J. &Chava, S. (2016). Socio-economic impact of and adaptation to extreme heat and cold of farmers in the food bowl of Nepal.*International Journal of Environmental Research and Public Health, 16(9), 1578-1583*

Bolton, S. &Kacperczy, J. (2021).Climate finance. *Annual Review of Financial Economics, 13 (1), 15-36.*

Caby, M. K., Ziane, G. &Lamarque, P. (2020).The impacts of carbon (CO2) emissions and environmental research and development (R&D) investment on firm performance. *International Journal of Production Economics, (167), 1-11.*

Caratini, A, &Sen, K. (2019). Limit orders, depth, and volatility: evidence from the stock exchange of Hong Kong. *The Journal of Finance, 56(2), 767-788*

Carattini, S., Baranzini, A., Thalmann, P., Varone, F. and Vöhringer, F. (2017). Green taxes in a post-Paris world: are millions of nays inevitable. Environmental and Resource Economics, 68(1), 97-128.

Cerniauskas, S., Grube, T., Praktiknjo, A., Stolten, D. and Robinius, M. (2019). Future Hydrogen Markets for Transportation and Industry: The Impact of CO2 Taxes. Energies, 12(24), 4707.

Choi, Z. Yin, X & Jiang, J. (.(2020). Beating earnings benchmarks and the cost of debt.*The Accounting Review, 83(2), 377-416*.

Dai, Q., Yang, J. and Li, D. (2018). Modeling a three-mode hybrid port-hinterland freight intermodal distribution network with environmental consideration: The case of the Yangtze river economic belt in China. *Sustainability,* 10(9), 3081.

Datta, T.K., (2017). Effect of green technology investment on a production-inventory system with carbon tax. *Advances in Operations Research*, 2017

Di Maria, C., Smulders, S. and Van der Werf, E. (2017). Climate policy with tied hands: optimal resource taxation under implementation lags. *Environmental and Resource Economics*, 66(3), 537-551.

Dulebenets, M.A., (2018). Green vessel scheduling in liner shipping: Modeling carbon dioxide emission costs in sea and at ports of call. *International Journal of Transportation Science and Technology*, 7(1), 26-44.

Faisal, J. Baban, A. & Taylor, B. (2022). Examining industrial structure changes and corresponding carbon emission reduction effect by combining input-output analysis and social network analysis. *Journal of Cleaner Production, (162), 61-70*

Feyen, B. S., Utz, M A., Huertas, M., Bogdan, S. Moon, G. (2020). A climate stress-test of the financial system.*Nature Climate Change, 7(4), 283-288,*

Gramkow, C. (2020). Reducing emissions from deforestation and forest degradation.*Annual*

Review of Environment and Resources, 36(1), 373-396,

Haryati, N.N., Winarno, W.A. and Sulistyono, S., (2018). Determining the advertisement of tax priority on urban road based on road performance. In MATECWeb of Conferences (Vol. 181, 08001). EDP Sciences.

Ilaboya, B. &Ofiafor, K. (2020). Climate change and credit risk. *Journal of Cleaner Production, 266(1), 1-10*.

Ivanov, I.G. and Hartmann, D. (2016). Two green bottles, standing on a wall: an environmental assessment of two bottle types. South African Journal of Industrial Engineering, 27(3), 303-314.

Kling, A. G., Murinde, L. &Ayas, P. (2021). The economic and environmental impact of acarbon tax: a computable general equilibrium analysis. *Ecological Economics, (100), 40 50*

Kuralbayeva, K. (2019). Environmental taxation, employment and public spending in developing countries.Environmental and resource economics, 72(4), 877-912.

Li, Y. (2020). Pricing uncertainty induced by climate change. *The Review of Financial Studies, 33(3), 1024-1066*

Lin, H., Tao, Q., Fengxiang, G. and Zhiwei, T. (2011). Study on Green Production Oriented Chinese Resource Tax Reform HUANG. Energy Procedia, 5, 1055-1059.

Liu, Y. &Anbumozhi, K. (2009).“Pricing climate change risks: CAPM with rare disasters and stochastic probabilities”, CER-ETH Working Paper Series Working Paper, (19), 311.

Luo, L. and Tang, Q. (2014).Carbon tax, corporate carbon profile and financial return.*Pacific Accounting Review, 26(3)*, 202-214

Meah, N. (2019). Climate uncertainty and policy making – what do policy makers want to know?” *Regional Environmental Change, 19(6), 1611-1621.*

Mishra, v. and Mittal, A. (2019).Policies for Sustainable Manufacturing and Extended Producer Responsibility for Green and Sustainable Manufacturing in India–a Review.

Miu, L.M., Wisniewska, N., Mazur, C., Hardy, J. and Hawkes, A., 2018. A simple assessment of housing retrofit policies for the UK: what should succeed the energy company obligation? Energies, 11(8), 2070.

Murfin, R. & Siegel, P. (2020).A technical and economic potential of solar energy application with feed-in tariff policy.*Procedia Environmental Sciences, (20), 89-96.*

Nwaiwu, B. &Oluka, E. (2018). Carbon risk and firm performance: evidence from a quasinatural experiment. *Australian Journal of Management, 43(1), 65-90.*

OECD (2020). “A new horizon”, Speech to European Commission Conference: A Global Approach to Sustainable Finance, March 21.

Olade, M. K. (2018). Climate change implications for fisheries and aquaculture.*FAO Fisheries and Aquaculture Technical Paper, (530), 212-222.*

Pevzner, B., Xie, Y &Xin, M. (2015). Climate Change and Growth Risks (No. w23009), National Bureau of Economic Research

Price, C. Duran, T., Peterson, B. & Bliss, V. (2012). Multivariate GARCH models: a survey. *Journal of Applied Econometrics, 21(1),79-109.*

Rengs, B., Scholz-Wäckerle, M. and van den Bergh, J., 2020. Evolutionary macroeconomic assessment of employment and innovation impacts of climate policy packages. Journal of Economic Behavior & Organization, 169, pp.332-368.

Sasb, Y. S. (2016). Changing industrial structure to reduce carbon dioxide emissions: a Chinese application.*Journal of Cleaner Production, (103), 40-48*,

Siebers, P.O., Tran, T.H. and Mao, Y. (2019).OptimisingDecarbonisation Investment for Firms towards Environmental Sustainability.

Solail, D. R. & Husain, M. (2009). Forecasting multivariate realized stock market volatility. *Journal of Econometrics, 160(1), 93-101.*

Stathopoulou, E. and Gautier, L. (2019).Green alliances and the role of taxation. Environmental and Resource Economics, 74(3), 1189-1206.

Sun, A. (2013).The establishment of the green tax policy in china-to accelerate the construction of circular economy experimental zone in Qaidam Basin of Qinghai Province as an Example. Asian Social Science, 9(3), 148.

Tran, T.H., Mao, Y. and Siebers, P.O. (2019). Optimizing De-carbonization Investment for Firms towards Environmental Sustainability. Sustainability, 11(20), 5718.

Tsai, W.H., (2018). A green quality management decision model with carbon tax and capacity expansion under activity-based costing (ABC): A Case Study in the Tire Manufacturing Industry. Energies, 11(7), 1858.

Tsai, W.H., (2018). carbon taxes and carbon right costs analysis for the tire industry. Energies, 11(8), 2121.

WEF (2019).“Measuring Fossil Fuel Subsidies in the Context of the Sustainable Development Goals.” Nairobi: UN Environment. https://www.iisd.org/publications/measuring-fossilfuel-subsidies-context-sustainable-development-goals