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We look forward to receiving your submissions.

Do Fuel Subsidy Shocks Prolong Price Instability in Nigeria?



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Abstract

This study investigates the long-term impact of fuel subsidy reduction/removal from December 1996 to August 2023 on the general price level in Nigeria using a dynamic autoregressive distributed lag model. The findings reveal cointegrating relationships in all estimated models. Furthermore, a positive shock to the positive semi-variance of fuel prices consistently increases inflation rates, demonstrating how fuel subsidy reforms disrupt price stability and hinder effective fiscal-monetary policy coordination. In contrast, a positive shock in the money supply does not lead to a significant or prolonged increase in all inflation rates. This suggests that eliminating fuel subsidies poses a greater risk to price stability. In conclusion, this study observes that subsidy removal/reduction has a lasting impact on inflation and can compromise the effectiveness of monetary policy in stabilizing prices. The study recommends exploring innovative approaches to fund fuel subsidies through taxation when necessary.

JEL: E31, E37, E51, E61, E62

1.0 Introduction

The need for subsidy reforms has been attributed to the shrinking fiscal space of the government and the necessity to reallocate resources to cover the growing infrastructural gap and address the market failures associated with prolonged energy subsidies. Soile and Mu (2015) observed that prolonged energy subsidies not only benefit the wealthiest households more but also worsen income inequality.

Additionally, they encourage smuggling fuel into neighbouring countries. Notably, reports indicate that more than 80 per cent of fuel sold in Benin Republic was smuggled into the country (IMF, 2012).

The significant fuel price disparity between Nigeria and its neighbouring countries serves as an attraction for such smuggling at the expense of the subsidized economy.

Proponents of the new economic policy (NEP) argue that, to increase public investment without exacerbating the existing fiscal deficit, the government needs to implement subsidy cuts and redirect those resources to fund infrastructural projects (Ghosh and Ghosh, 2003).

The need to question the relevance of energy subsidies grows during periods of decreasing fiscal space for the government, especially in times of economic uncertainty. This recommendation is based on the belief that the adoption of fuel subsidies has come at the cost of crowding out the government's share of total investment in socio-economic development.

From a historical perspective, previous attempts to eliminate the fuel subsidy have encountered strong resistance from the National Labour Congress. The most prominent instance was the January 2012 subsidy removal, which was accompanied by nationwide protests. A survey study conducted by McCulloch et al. (2021) revealed that the majority of households, primarily the poor, are more likely to oppose fuel subsidy removal or reduction due to the economic implications of a positive shock in fuel prices that would be inflationary.

The fuel pump price serves as a key indicator of government reforms in the oil sector through the price modulation scheme. Figure 1 displays the discrete

growth rate of fuel prices from December 1996 to August 2023. The significant spikes observed throughout this period indicate government withdrawals of the fuel subsidy. Between 1996 and 2008, there were fewer than five recorded instances of positive increases in fuel pump prices.

However, from 2009 onwards, these positive spikes became more frequent and sporadic, especially from 2016 onward. This period coincides with increased domestic and global uncertainty following the global financial crisis.

The growth rate of fuel prices from mid-2020 onwards reflects a deregulated structure, even though the government did not officially declare the removal of fuel subsidy. This period indicates the government's indifference towards the fuel subsidy. One of the objectives of this study is to assess the role of these sporadic increases in fuel prices on price stability. The persistence of historical prices following the initial increases resulting from fuel subsidy reforms suggests that previous attempts at full subsidy removal have failed.

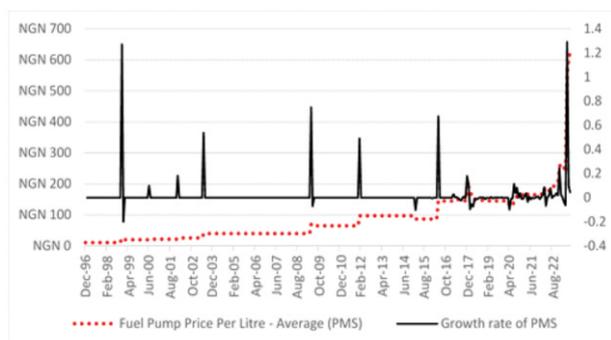


Figure 1. Fuel Pump Price and its growth rate

The inflationary pressure created by this situation on average prices in Nigeria has garnered significant discussion in the literature.

The Central Bank of Nigeria has been grappling with price instability since the 2016 recession. Meanwhile, the fiscal authority is making attempts to eliminate energy subsidies and is accompanied by income transfers to mitigate the welfare effects of such reforms. These policy frameworks adopted by both authorities weaken (or deepen) the gains (or losses) from the presence (or absence) of fiscal and monetary policy coordination, thus allowing price

instability to persist. In the case of Iran, where such reforms have been adopted, as stated by Hoseininasab and Niri (2012), liquidity tends to be higher, creating more inflationary pressure on the economy.

The quantitative analysis of the economic implications of the government's recurring and sudden announcements of fuel subsidy removal on price stability is virtually non-existent in Nigeria. Significant attention has been focused on the effects of oil prices on macroeconomic indicators, especially the consumer price index. Studies by Zarepour (2022) for Iran and Otoakhia et al. (2023) for Nigeria have established that energy price reforms lead to increase in inflation rates.

However, apart from Otoakhia et al. (2023), no studies have examined the dynamic response to positive shocks. Also, the earlier studies did not consider the role of money supply growth in the model. Additionally, the sample range in Otoakhia et al. (2023) does not cover the recent positive shock to fuel prices caused by the fuel subsidy removal in Nigeria and did not account for potential breakpoints caused by spikes in energy prices in their models.

This study attempts to fill the gap by examining whether there are any prolonged impacts of positive shocks to fuel prices on the general price level. This paper also considers the role of money supply in the model, utilizing more informative data on fuel prices from December 1996 to August 2023. The discussion on fuel subsidy reforms tends to intensify when government fiscal space shrinks and debts keep accumulating. This implies that the issue of fuel subsidy removal will become a regular exercise whenever economic uncertainty worsens.

This exercise has dire consequences for harmonizing fiscal and monetary policy tools to achieve price stability. Knowledge of the long-term impact of incessant fuel subsidy reforms can shed light on understanding the prolonged impact of policy inconsistency between the government and the monetary authority in achieving price stability.

The paper makes the following contributions to the literature. I employ more informative data to examine the impact of fuel subsidy removal on price levels within a dynamic ARDL framework. Fuel subsidy

removal or reduction is quantified using the positive semivariance of the realized volatility of fuel prices. This paper investigate how price levels respond to positive shocks in positive semivariance over a specified time horizon.

The rest of the paper is organized into four sections. Section 2 provides an overview of scholarly works related to energy subsidies. Section 3 presents the data and methodology. In Section 4, I present, interpret, and discuss the study's results. Finally, Section 5 includes summary, conclusion, and policy recommendations of the study.

2.0 Literature review

2.1 Theoretical Literature

The realm of economic theory boils down to a fundamental question: how much should the government intervene in the market to achieve optimal outcomes? From the Keynesian perspective, a proactive government is essential to reaching full employment. They are of the view that markets struggle to reach equilibrium, mostly during recessions, leading to unemployment. Through fiscal and monetary policies, such as the introduction of energy subsidies and lower interest rates, governments can directly stimulate demand and pull the economy out of recession.

The Neoclassical believe that rational actors in competitive markets will naturally reach full employment over time. Flexible wages and prices act as signals, guiding resource allocation efficiently. Government intervention, like energy subsidies, can distort these signals and hinder the benefits of a competitive market. Their ideal role for government is ensuring a stable legal and monetary framework for markets to flourish.

The Neoclassical Synthesis framework bridges the gap between Keynesian and neoclassical thoughts by advocating for demand management interventions in downturns alongside long-term investments in infrastructure and education to boost productive capacity. Energy subsidies, for example, might offer

short-term demand boosts, but their long-term impact on competition and efficiency requires careful evaluation. The neoclassical synthesis suggests that policymakers should consider a balanced approach, combining short-term stimulus measures with structural reforms.

2.2 Empirical Literature

The empirical literature on the impacts of fuel subsidy reforms on macroeconomic indicators is quite limited and focused on economies where the relevance of energy subsidies is being questioned. However, there have been studies examining the role of energy reforms in Iran, Egypt, Indonesia, India, and Nigeria. These studies uniformly highlight the various impacts of subsidy reforms on the economy.

We can start with the research conducted by Bental and Spiegel (1981), who investigated consumption subsidies and their connection to both inflation and income distribution. The authors observed that subsidies funded through taxes do not lead to higher inflation and are Pareto optimal, while money-financed subsidies create inflationary pressure. Ghosh and Ghosh (2003) examined the conditions under which fuel subsidy removal and raising public investment will have either positive or negative effects on the Indian economy.

The authors observed the outcome of subsidy reforms and raising government investment impact on the economy depends on factors such as price elasticity, private sector behaviour, and the role of infrastructure in agricultural production. They observed when the price elasticity of agricultural production is high, subsidy removal accompanied by raising government investment may lead to inflation. When there are constraints which mitigate agricultural output, increasing public investment alongside the elimination of fuel subsidy will not create any inflationary pressure in the short run.

Abouleinein et al. (2009) assessed the impact of increasing energy prices on key macroeconomic indicators in Egypt. The finding indicates a 10 per cent increase in fuel price results in a 0.45 percentage point inflation increase. In an extreme scenario where all petroleum subsidies are removed, CPI-based inflation skyrockets by almost 37 percentage points.

Hoseininasab and Niri (2012) analysed how energy subsidy reform influences inflation in Iran. The authors appear to argue that energy reforms can contribute to inflation and income redistribution is seen to mitigate potential negative effects of these reforms. However, they also caution that income redistribution, if not carefully managed, can itself lead to inflationary pressures.

Elshennawy (2014) contrasted the immediate removal of subsidies in perfect and imperfect competition scenarios to assess the degree of welfare loss attributed to imperfect competition in Egypt. The author observed that the full removal of energy subsidies harms both the rich and the poor. Weaker businesses close, while surviving ones gain market power, leading to higher prices due to imperfect competition. Rahiminia et al. (2015) forecast the micro and macroeconomic consequences of implementing a fuel subsidy targeting strategy in Iran. They noted fuel subsidy is predicted to increase inflation by 16.1 to 21.1 per cent.

Gharibnavaz and Waschik (2015) examined subsidy reforms and income redistribution in Iran. The authors highlighted a trade-off between welfare and price stability when it comes to subsidy removal and income redistribution. While such policies can benefit individuals and address income inequality, they may also lead to inflationary pressures that can be detrimental to the overall stability of an economy.

Acharya and Sadath (2016) computed the impact of subsidy reforms under different scenarios on price levels in India. Among the several observations, subsidy removal leads to a 1.38 per cent WPI increase, while a 50 per cent reduction results in a 0.69 per cent WPI increase.

Omotosho (2019) examined the extent of economic instability linked to the elimination of fuel subsidies in Nigeria under the Dynamic Stochastic General Equilibrium model. The author's analysis suggests that fuel subsidies appear to have a slight positive impact on price stability, as their absence results in increased volatility in inflation rates, particularly during periods of oil price shocks. This implies that fuel subsidies may help mitigate the impact of oil price fluctuations on inflation to some extent. However, the magnitude of this effect and its overall economic implications would depend on various

factors, including the structure of the subsidy system, the size of the subsidies, and other macroeconomic conditions.

Beutel (2020) analysed the effects of altering fuel subsidies and tax policies on output, inflation, and trade in Austria. They stated that the removal of all subsidies would lead to a general increase in the prices of domestic products. Handayani et al. (2020) investigated the implementation of the subsidy reduction policy and its consequences on economic performance, with a particular focus on its influence on economic growth in Indonesia. They observed such reform boosted economic growth by 0.6 per cent and reduced inflation by 0.02 per cent.

Zarepour (2022) assessed the immediate and long-term effects of Iran's 2010 energy subsidy reform on key macro indicators, such as GDP and inflation. The author observed changes in energy prices lead to inflationary effects, which became notable in the initial two years before gradually diminishing over time. The reform of energy subsidies results in recurring inflationary consequences.

A cointegrating connection exists between energy pricing and the explanatory factors, including inflation. Otoakhia et al (2023) investigated the influence of fuel subsidy removal on the cost of living in Nigeria between 2003 and 2021.

The findings suggest that there is a cointegrated relationship between fuel subsidy payments and the cost of living. Fuel subsidy removal or reduction is associated with increased food and headline inflation rates, with food inflation being more responsive. However, this impact is statistically insignificant in the short run and only becomes mildly significant in the long run for food inflation.

2.3 Summary and Research Gap

Based on the literature we have reviewed, it is clear that the method of funding subsidies plays a crucial role in determining the impact of their removal on an economy.

We have also observed that various conditions influence the effect of subsidy removal on the price level. Undoubtedly, the overwhelming evidence in the reviewed literature suggests that subsidy removal does, indeed, affect the price level. In many cases, whether it's a partial or complete removal of energy

subsidies, it leads to an increase in the price level.

However, very few studies have examined whether this impact persists or diminishes in the long run.

In the case of Nigeria, there is paucity of literature examining the degree of instability caused by such subsidy removal, even when using a more informative sample. Furthermore, apart from Otoakhia et al. (2023), no studies have delved into the positive semivariance of fuel price, whose values are influenced by subsidy removal.

This paper aims to decompose fuel prices into positive and negative semivariance and then specifically analyze the dynamic response of inflation rates to any shock in the positive semivariance component. This can provide insight into whether the impact of fuel subsidy removal on inflation, driven by the increase in fuel prices, has a persistent destabilizing effect on the price level.

This finding is essential as it sheds light on how the recurring government announcements of fuel subsidy removal over the past two decades are threatening the coordination of fiscal and monetary policies aimed at controlling price instability.

3.0 Methodology and Sources of Data

3.1 Data

This study uses Fuel Pump Price Per Litre - Average (PMS) and narrow money (M1) as explanatory variables. These variables are represented in logarithmic form. Fuel price returns are estimated by calculating the difference in the logarithmic values. The dependent variables chosen are the 12-month average changes (%) in headline, food, and core inflation rates. The 12-month average clearer picture of the underlying trend in inflation.

All variables are sourced from the Nigeria Bureau of Statistics and the Central Bank of Nigeria databases and range from December 1996 to August 2023.

3.2 Model Specification

3.2.1 Realized variance estimation

The returns of the fuel price (FP) are computed using the equation

$$r_t = FP_t - FP_{t-1} \tag{i}$$

Where FP_t and FP_{t-1} are in logarithm form.

The realized variance of the fuel price (RVP) is estimated as

The next approach in decomposing the realized variance in equation 2 was introduced by Barndorff-Nielsen et al. (2010). The realized positive semivariance (subsidy removal/reduction) is computed as

$$RVP_t^- = r_t^2 \mathbb{I}(r_t < 0)$$

And the negative semi variance (subsidy deepening) is computed as

$$RVP_t = RVP_t^+ + RVP_t^- \tag{iv}$$

With the indicator variable, the realized variance is simply

$$RVP_t = RVP_t^+ + RVP_t^- \tag{v}$$

3.2.2 Unrestricted Error Correction Mode

The estimated model is specified as

$$\Delta P_t = \alpha_0 + \alpha_1 t + \gamma_1 P_{t-1} + \gamma_2 RVP_{t-1}^- + \gamma_3 RVP_{t-1}^+ + \gamma_4 M1_{t-1} + \sum_{i=1}^p \theta_i \Delta P_{t-i} + \sum_{j=2}^k \sum_{l=0}^{qj} \varphi_{j,l} \Delta SV_{j,t-l} \tag{vi}$$

Where P_t is the inflation rate, α_0 is the trend coefficient, $\alpha_1, \gamma_1, \gamma_2, \gamma_3, \gamma_4$ are the parameter coefficients, $\theta_1, \theta_2, \theta_3, \theta_4$ the shortrun coefficients. SV is a 1x3 dimensional vector containing the explanatory variables

3.3 Estimation Procedure

we begin estimating the unit root test to assess if all variables are stationary at level or first difference.

The R package *dynamac* by dan and Philip (2020) was adopted. This package is useful for simulation of positive shocks to any of the independent variables in an autoregressive distributed lag model.

Table 1. Descriptive statistics

	FP (1)	FI (2)	HI (3)	CI (4)	M1 (5)	PSFP (6)	NSFP (7)	RVFP (8)
Mean	84.03	12.15	12.43	12	6202451	0.01	0	0.01
Variance	5795.27	53.79	18.63	28.73	3.44E+13	0	0	0
Skewness	3.06	-0.59	0.09	1.39	1.13	9.75	14.1	9.72
Ex.Kurtosis	16.89	1.26	-0.01	2.77	0.68	101.45	221.28	101.01
JB	4302.33***	39.67***	0.4	205.91***	74.17***	142308.02***	663473.94***	141066.82***
ERS	4.02	-3.32***	-1.46	-2.10**	5.07	-6.37***	-7.83***	-6.40***
Q(1)	255.31***	311.31***	299.96***	305.22***	311.65***	0.04	0.01	0.15
Q2(1)	175.85***	303.10***	283.24***	304.70***	302.62***	0.03	0.01	0.02
kendall	Kendal correlation							
Fuel Price (1)	1.00***	0.38***	0.21***	0.10***	0.90***	0.42***	0.32***	0.55***
Food Inf (2)	0.38***	1.00***	0.68***	0.02	0.33***	0.28***	0.20***	0.36***
Headline Inf (3)	0.21***	0.68***	1.00***	0.30***	0.15***	0.21***	0.13***	0.26***
Core Inf (4)	0.10***	0.02	0.30***	1.00***	0.05	0.12***	0.04	0.13***
M1 (5)	0.90***	0.33***	0.15***	0.05	1.00***	0.38***	0.31***	0.51***
PSFP (6)	0.42***	0.28***	0.21***	0.12***	0.38***	1.00***	-0.15***	0.70***
NSFP (7)	0.32***	0.20***	0.13***	0.04	0.31***	-0.15***	1.00***	0.54***
RVFP (8)	0.55***	0.36***	0.26***	0.13***	0.51***	0.70***	0.54***	1.00***

Note: 1 Note: ***p < 0.01; **p < 0.05; *p < 0.1; Inf: Inflation, PSFP: Positive semivariance of fuel subsidy, NSFP: Negative semivariance of fuel subsidy, RVFP: Realized variance of fuel price, Skewness: D'Agostino (1970) test, Kurtosis: Anscombe and Glynn (1983) test, JB: Jarque and Bera (1980) normality test, ERS: Stock et al. (1996) unit-root test, Q(20) and Q2(20): Fisher and Gallagher (2012) weighted portmanteau tests. Table values estimated via Gabauer (2022) R package.

4.0 Presentation and Interpretation of results

4.1 Descriptive Statistics

The results in Table 1 reveal that the fuel price shows a higher variance value. Among the inflation rates, food inflation has the highest variance, followed by core and headline inflation. The variables are not normally distributed, except for headline inflation. According to the Stock et al. (1996) unit root test, all the variables are stationary at the level, except for fuel price, headline inflation, and money supply. Additional unit root test results are presented in Table 2.

The correlation results show a positive association between inflation rates and fuel prices. Food inflation exhibits a stronger connection with fuel prices compared to other inflation rates, although all

associations are less than 0.4. Money supply demonstrates a positive link with inflation rates, particularly with food inflation compared to other rates.

The realized variance of fuel prices shows a stronger correlation with positive semivariance compared to negative semivariance. This suggests that fuel price variance is primarily influenced by positive semivariance. Regarding inflation rates, the positive semivariance exhibits a more significant positive association with inflation than the negative semivariance, but both are positively related to inflation.

The realized variance of fuel prices has a more pronounced impact on food inflation than on other rates, although this impact remains below 0.4 in all inflation rate associations.

4.2 Unit root test

Table 2. Unit root test

	ADF		PP	
	Constant	Constant & trend	Constant	Constant & trend
Panel A: Level				
log of fuel price	0.22	-2.59	0.28	-2.89
Food inflation	-5.98**	-6.82**	-2.76	-3.54*
Headline inflation	-5.03**	-5.24**	-3.39*	-3.83*
Core inflation	-6.99**	-7**	-3.72**	-3.63*
Log of money supply	-1.77	-1.67	-1.82	-1.6
fuel_pos	-12.82**	-12.8**	-18**	-17.98**
fuel_neg	-12.42**	-12.4**	-17.71**	-17.68**
Panel B: First Difference				
log fuel price	-13.38**	-13.39**	-19.42**	-19.42**
Food inflation	-4.57**	-4.56**	-4.71**	-4.69**
Headline inflation	-5.12**	-5.11**	-5.19**	-5.17**
Core inflation	-4.62**	-4.62**	-5.22**	-5.22**
Log of money supply	-15.8**	-15.92**	-21.8**	-21.99**
fuel_pos	-21.46**	-21.43**	-47.88**	-47.78**
fuel_neg	-21.39**	-21.36**	-47.29**	-47.2**

Note: 2. ** 0.01, * 0.05 significance level, fuel_pos and fuel_neg indicate positive and negative increase in fuel price_

The Augmented Dickey-Fuller and Philip Perron tests are displayed in Table 2. These tests aim to identify non-stationary variables at various orders. From Table 2, we observed that no variable necessitates further differencing beyond the first to attain stationarity. In other words, some variables are stationary at their original level, and all variables achieve stationarity after the first difference. None of the variables require second differencing for stationarity.

Table 3 displays the unrestricted error correction model, Pesaran et al. (2001) bounds test, and the model diagnostics test. The three estimated models show no autocorrelation (AUTC). The F-statistic (Fstat) represents the calculated bounds test statistics for cointegration. The calculated value exceeds both the lower boundary (LB) and upper boundary (UB) of the critical values in all three models, indicating the presence of cointegration between the inflation rate and the explanatory variables.

4.3 Unrestricted Error Correction Model

Table 4. Unrestricted Error Correction Model

	(1)	(2)	(3)		(1)	(2)	(3)
(Intercept)	0.69 (0.64)	-0.05 (1.06)	2.40 [*] (1.07)	l.1.ms	-0.04 (0.05)	0.02 (0.08)	-0.16 [*] (0.08)
l.1.core_inf			-0.03 ^{***} 0.00	l.1.fuel_neg	-30.47 [*] (15.14)	-10.78 (19.98)	-42.57 [*] (24.47)
l.1.FD_inf		-0.03 ^{***} 0.00		ld.1.ms	0.08 (0.27)	0.05 (0.45)	0.37 (0.45)
l.1.HD_inf	-0.02 ^{***} 0.00			ld.2.ms	0.2 (0.26)	-0.26 (0.44)	0.6 (0.45)
ld.1.HD_inf	1.03 ^{***} (0.06)			ld.3.ms	0.08 (0.26)		1.07 [*] (0.44)
ld.2.HD_inf	-0.14 [*] (0.08)			ld.1.fuel_neg	29.25 [*] (12.53)	2.24 (14.42)	29.8 (19.86)
ld.3.HD_inf	0.01 (0.06)			ld.2.fuel_neg	19.16 [*] (10.37)	2.15 (7.62)	20.42 (15.92)
d.1.fuel_pos	0.09 (0.22)	0.17 (0.38)	0.28 (0.38)	ld.3.fuel_neg	15.14 [*] (7.62)		12.79 (10.71)
	(1)	(2)	(3)		(1)	(2)	(3)
l.1.fuel_pos	1.69 [*] (0.83)	0.69 (1.15)	3.87 ^{**} (1.44)	ld.4.fuel_neg	15.84 [*] (6.25)		15.61 [*] (7.65)
ld.1.fuel_pos	-1.51 [*] (0.72)	-0.79 (0.94)	-2.85 [*] (1.24)	ld.5.fuel_neg	9.04 [*] (4.44)		
ld.2.fuel_pos	-1.23 [*] (0.65)	-0.34 (0.81)	-1.93 [*] (1.13)	trend	0 (0.00)	0 (0.00)	0.00 [*] (0.00)
ld.3.fuel_pos	-0.39 (0.46)		-0.89 (0.79)	ld.1.FD_inf		0.98 ^{***} (0.06)	
d.1.fuel_neg	2.73 (5.42)	-1.64 (9.47)	-1.86 (9.27)	ld.2.FD_inf		-0.19 [*] (0.08)	
d.1.ms	0.06 (0.26)		-1.20 ^{**} (0.45)	ld.3.FD_inf		0.14 [*] (0.06)	
				ld.1.core_inf			0.85 ^{***} (0.06)
				ld.2.core_inf			0.06 (0.06)

Response	HD inflation	FD inflation	Core inflation	HD inflation	FD inflation	Core inflation
Fstat	6.47	11.23	14	6.47	11.23	14
lb	4.01	4.01	4.01	4.01	4.01	4.01
ub	5.07	5.07	5.07	5.07	5.07	5.07
tstat	-4.76	-6.68	-7.18	-4.76	-6.68	-7.18
lb	-3.41	-3.41	-3.41	-3.41	-3.41	-3.41
ub	-4.16	-4.16	-4.16	-4.16	-4.16	-4.16
AUTC	0	0.67	0.8	0	0.67	0.8
SW_test	0.9***	0.78***	0.86***	0.9***	0.78***	0.86***
R ²	0.86	0.86	0.85	0.86	0.86	0.85
Adj. R ²	0.85	0.85	0.83	0.85	0.85	0.83
Num. obs.	314	316	315	314	316	315
RMSE	0.23	0.41	0.4	0.23	0.41	0.4

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; (\circ) $p < 0.1$. 'd.1,...,n' is 1 to n lags difference, 'd.1' is first differenced, '1.1' is one lag, FD_inf, HD_inf, core_inf are food, headline and core inflation rates respectively. Ms is money supply, fuel_neg and fuel_pos are negative and positive changes in fuel price. Fstat and Tstat are computed bounds F and t statistics, lb and ub are lower and upper bounds tabulated values. AUTC is autocorrelation SW test is normality test.

Furthermore, the coefficients of the unrestricted error correction model are displayed in the upper section of Table 3. The error correction term is negative, less than 1, and statistically significant at a 1% significance level. My main focus is on examining the stochastic responses of inflation rates to shocks in the positive semivariance of fuel prices.

This paper also examined how inflation rates respond to shocks in money supply. For robustness, I examined another model with a dummy variable capturing fuel subsidy removal leading to a greater than 10% increase in fuel prices, along with money supply, to assess the response of inflation rates. This paper solely presents dynamic responses arising from shocks to the dummy variable.

To keep it concise, only the responses of inflation rates to the shock are depicted in Figure 4.

Figure 2, panel A (B and C), depicts the dynamic response of headline (food and core) inflation to a shock in positive fuel price semivariance.

The dashed line represents the response value, while the three shaded grey areas indicate confidence intervals. The closer these intervals are to the dashed line, the more significant the response to the shock.

The shock leads to an increase in inflation rates, but

with varying levels of significance. With the exception of the food inflation rate, all other inflation rates displayed significant responses to the shock.

The Figure 2 consistently illustrates an uninterrupted rise in inflation rates following the shock, signifying that the presence of fuel subsidies consistently disrupts price stability. This finding highlights how government action on fuel subsidy reform is counterproductive to fiscal-monetary policy coordination.

On the monetary aspect, this paper examines the response of a positive shock to the money supply (M1) on the price level.

The results in Figure 3 reveal distinct inflation rate responses. Unlike a positive shock to the positive semivariance of fuel prices, a positive shock to the money supply does not result in a significant or prolonged inflation increase.

This suggests that the removal of fuel subsidies poses a substantial threat to price stability. The government's removal of fuel subsidies, combined with an increase in income transfers to mitigate welfare impacts, does not necessarily reduce the high cost of living.

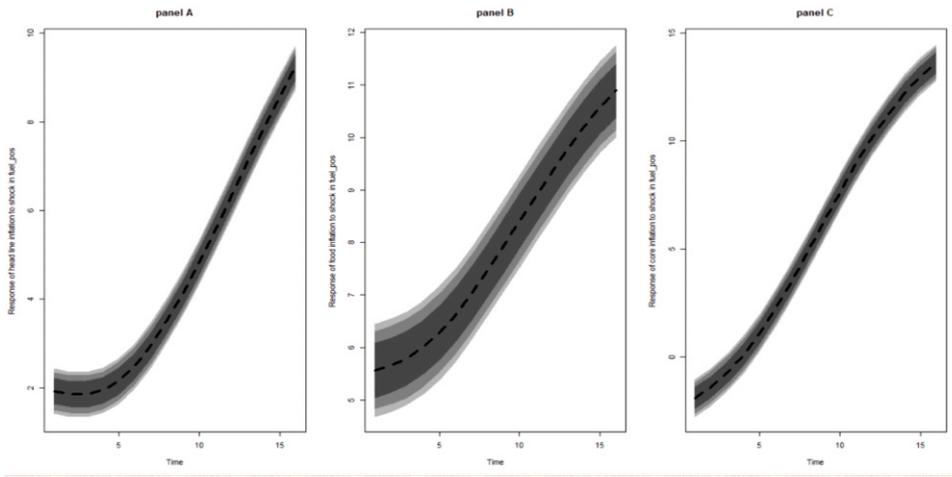


Figure 2. Inflation rates responses to shock in positive semivariance of fuel price

To evaluate the model's robustness in measuring fuel subsidies, this paper replaces semivariances with a dummy indicator:

1 when fuel subsidy removal/reduction leads to over a 10% fuel price increase, and 0(zero) otherwise.

The dynamac package accommodates shocks in

these dummies. Figure 4 illustrates inflation rate responses. Other results, for brevity, are available upon request. However, the model is diagnostically sound, as detailed in Table 3, and cointegration exists among the variables.

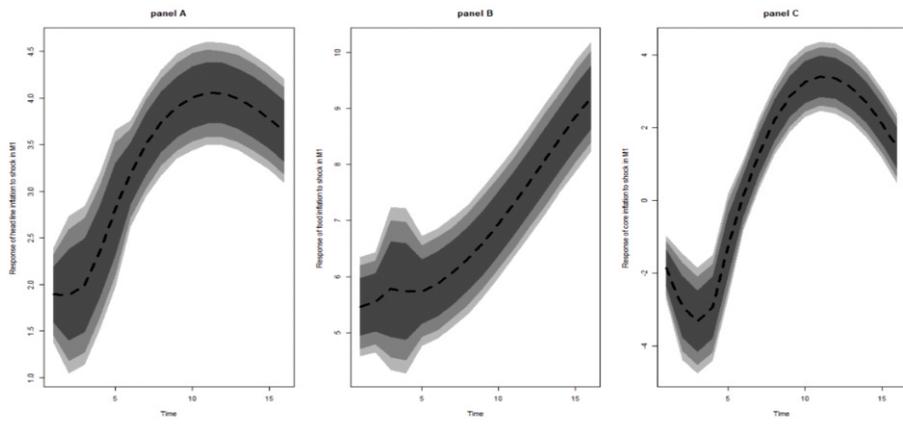


Figure 3. Inflation rates responses to shock in narrow money supply

The findings regarding the impact of fuel subsidy reform on price levels are robust for certain inflation rate variants, particularly core inflation.

Despite headline inflation's response resembling that in panel A of Figure 2, the effect is insignificant.

In the case of food inflation, the response differs in terms of direction and significance from panel B of Figure 2. Nevertheless, this paper's findings hold significant policy implications.

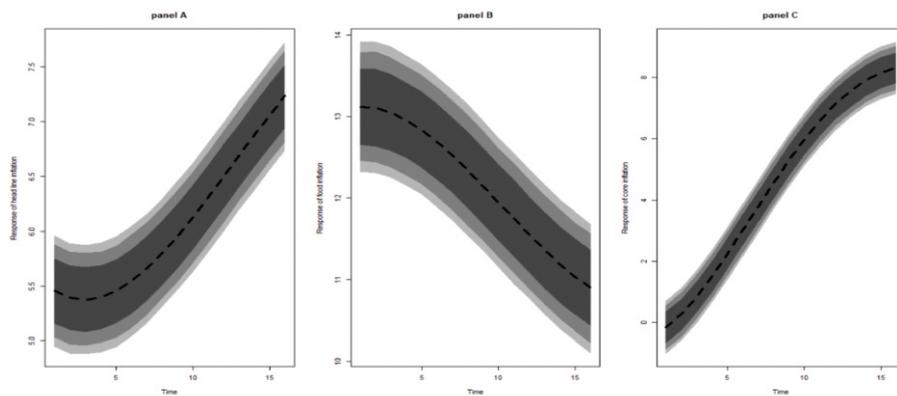


Figure 4. Inflation rates responses to shock in dummy variable of fuel subsidy removal

The removal of such subsidies, when accompanied by income redistribution and increased government spending on public investments, inevitably leads to a persistent increase in the price level.

The findings of this paper have shown that government actions in handling fuel subsidies are counterproductive to fiscal and monetary policy coordination in ensuring a stable cost of living. Anticipating subsidy discontinuation can cause dynamic economic changes, including inflationary pressures, leading up to the expected termination date (Bental & Spiegel, 1981).

Therefore, existing and future government regimes should refrain from intermittent removal of fuel subsidies and instead may consider implementing a new method of funding subsidies, such as introducing a fuel tax on non-commercial vehicles. This approach will promote energy efficiency and reduce CO₂ emissions.

5.0 Summary, Conclusion and Policy Recommendation

The presence of fuel subsidies undoubtedly cushions the cost of living, as it implies stability in historical fuel prices.

However, its continued existence is increasingly unsustainable, given the substantial infrastructural deficit and growing debt levels.

This study aims to understand the extent to which a positive shock to fuel prices, resulting from fuel subsidy removal, affects the price level in Nigeria from December 1996 to August 2023 within a dynamic autoregressive framework.

Understanding this dynamic is crucial for comprehending how intermittent subsidy reforms can disrupt the efforts of monetary policy in controlling existing inflation. Long-run cointegrating relationships are present in all estimated models.

The results reveal a prolonged increase in inflation rates following a positive shock to the positive

semivariance of fuel prices, indicating that fuel subsidy reforms disrupt price levels and impede fiscal-monetary policy coordination to achieve price stability.

In contrast, a positive shock to the money supply does not result in a significant and extended rise in inflation rates. This suggests that eliminating fuel subsidies poses a greater risk to price stability.

This paper concludes that the removal of fuel subsidies leads to uncontrollable increases in the inflation rate, with core inflation being particularly responsive to such government energy reforms.

In an economy grappling with price stability issues for the past two decades, these recurrent government actions are counterproductive to macroeconomic policy coordination.

In the interest of price stability and the enhancement of fiscal-monetary policy coordination, the economy should not be subjected to further attempts to completely eradicate energy subsidies if the current reforms fail.

Instead, the government can consider funding such subsidies through direct taxes on non-commercial private vehicles. Such a move would not only increase the government's tax base but also rectify the market failures that have been associated with prolonged energy subsidies.

If the current administration successfully eliminates fuel subsidies, relying solely on income transfers will not provide long-term stability in the cost of living.

These transfers are unsustainable given the current fiscal constraints of the government. Instead, an alternative subsidy approach, such as agricultural subsidies that encourage farmers and promote food security, may be more viable.

Further empirical research should focus on the micro and sectorial levels to identify the most vulnerable segments of the economy that are affected by these energy reforms.

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The Nexus between Foreign Capital Inflows and Stock Market Development in Nigeria: Does Interest Rate Matter?



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Abstract

This study analyzes the moderating effect of interest rates on the link between inflows of foreign capital and the Nigerian stock market development from 1986 to 2020. The result of the analysis of data via Auto-regression distributed lag (ARDL) techniques reveals that in the short run, interest rate and foreign direct investment inflows (FDI) have a direct negative effect on stock market development (SMD), but in the long run, both variables exert a positive effect on stock market development. But,

foreign portfolio investment inflows (FPI) and interest rates negatively influence SMD in the short and long run. However, the interaction of interest rate and FDI show a positive effect on SMD in the short run but negative effects in the long run, while the interaction of interest rate and FPI reveal a positive effect in the short and long run. The study concludes that interest rates are policy variable for the stock market to gain maximally from foreign capital inflows. The study, suggests the need to redirect interest rate policy to boost the inflows of foreign capital and enhance the development of the Nigerian stock market particular in the short run.

Keywords: Foreign Direct Investment, Foreign portfolio investment, Stock Market, Interest Rate, ARDL

JEL Classification: F21, F32, G12, E43.

1.0 Introduction

The stock market constitutes an integral part of the financial system and is crucial to the expansion and modernization of an economy (Aduda, Masila, & Onsonge, 2012). Because of its crucial function in the economy in mobilizing and facilitating the needed financial resources for investment, it is frequently recognized as the catalyst for economic growth and development (Tyson, Griffith-Jones & Velde, 2014; Adusah-Poku, 2016). The market serves as a conduit for transactions between foreign investors and serves as a main route for foreign capital inflows into emerging economies and less-developed countries (Basu & Nag, 2011).

The market's liquidity serves as a powerful catalyst for overseas investors, and increasing foreign capital inflows. A well-developed stock market provides the route through which a country can achieve sustainable growth and development and generate foreign capital inflows (Olokoyo et al, 2020).

Several studies conducted over the last decade have demonstrated the crucial role of foreign capital inflows (FCI) in fostering the growth of the stock market and economic performance (Raza, Jawaid, & Afshan, 2013; Bayar, 2017; Edo, 2018). Foreign capital inflows improve savings, encourage capital accumulation, raise the value of local companies' current assets, and strengthen the capital structure

(Bayar, 2017; Bayar, & Gavriletea, 2018). Large FCI and strong stock market performance have been observed and proven to be related to one another in developed and emerging economies (Raza, Jawaid, & Afshan, 2013; Bayar, 2017).

However, empirical results on the stock market are still largely inconclusive despite the consistent evidence of a positive influence of foreign capital inflows in developing nations. While studies like (Raza, et al., 2013; Zafar, 2013; Ekeocha et al., 2012; Nyangoro, 2013) show evidence of the significant influence of foreign capital inflows (FCI), studies like (Odo et al., 2016; Abubakar & Danlandi 2018; Sajid et al 2021) shows the insignificant effect of foreign capital inflows.

Studies have begun to concentrate on the recipient nation's absorptive capacity as a consequence of the ambiguous and conflicting effects of inflows of foreign capital on economic performance in developing countries (Akhtaruzzaman, 2019). These absorptive abilities have the power to transform economies into either an area that attracts international capital flows or one that repels it (Olaberria, 2015; Akhtaruzzaman, 2019). According to recent studies on the subject, (Tang, 2015; Adeniyi, et al 2015; Baharumshah et al, 2015; Hoque & Yakob, 2017; Acheampong, 2019), local absorptive abilities are crucial in supporting the inflows of FCI and its beneficial spillover. For instance, absorptive ability has been recognized as a crucial component in mediating foreign direct investment (FDI) spillover in the literature in analyzing the link between FDI and economic growth (Dada & Abanikanda, 2021).

Theoretically, the interest rate is one of the basics of macroeconomics and a key tool for the monetary authority's policymaking. It is important for preserving macroeconomic stability as well as for attracting foreign investment (Okpanachi, 2012; McCloud and Delgado, 2018; Nyangoro, 2015; Ulke and Barument, 2015; Koepke, 2015). Even in an open economy with unrestricted capital mobility, Serrano & Summa (2015) contend that the monetary authority has the authority to arbitrarily set the domestic interest rate because there is no spontaneous market mechanism to guarantee the spontaneous change of the interest rate and exchange rate to sustainable levels. The policy tool is

chosen after taking into account the situation of the economy and the goal to implement monetary policy measures.

The connection between the stock market growth and the FCI may also be impacted by the interest rate. It is widely agreed upon that this economic variable plays a crucial role in influencing the level of inflows of foreign capital and SMD of a nation for it acts as a main instrument in determining the level of investment in stocks (Odior & Nwaogwugwu, 2016; Osuagwu, 2009), and the foreign capital inflows depend on the interest rate as a return on investment (Rout & Mallick, 2020). Changes in interest rates raise the amount of liquidity in the system through capital inflows (Kumar & Kumar, 2014; Ulke & Barument, 2014), as well as the types of investments inflow into the economy (Adugna, 2017). Changes in interest rates may also have an impact on how well an economy performs when there are lower or higher inflows of foreign capital. As a result, if capital inflows are bigger or smaller, the depth of interest rate will exert a varied influence on stock market performance (Ulke & Barument, 2014).

Though it seems reasonable to suggest that foreign capital inflows can help the recipient nation more, the recipient nation's ability to profit significantly and consistently from these inflows may be constrained by its domestic interest rates. This suggests that depending on the interest rate level, the consequence of FCI on stock market growth in nations with similar levels of inflows may vary.

Many developing nations, including Nigeria, have used interest rates as an instrument for policy to lessen the negative influences that inflows of foreign capital can have on the receiving nation (Okpanachi, 2012). This is because some forms of capital inflows may have a negative net impact, particularly when it comes to developing economies. Even worse, large capital inflows could trigger a financial crisis, destabilize the economy, and make it more challenging to implement macroeconomic measures that will maintain strong economic development without inflating the price of goods (Ahmed and Zlate, 2013).

Empirical research on the effect of FCI on stock market growth has largely been the subject of a heated debate between opposing viewpoints, and the

results are relatively ambiguous. As a result, studies abound on the connection between macroeconomic factors and SMD (Acquah-Sam, 2016; Olokoyo et al 2020; Asravor and Fonu, 2020).

These studies demonstrated how interest rates and foreign capital inflows directly influence stock market performance (Olokoyo et al, 2020; Asravor and Fonu, 2020). But the stock market growth goes beyond the behaviour from of interest rate or foreign capital inflows stance alone. In addition to the direct impact of interest rates, the interest rate also has an indirect impact on stock market growth through foreign capital inflows. Meanwhile, empirical investigation on the links between interest rates, FCI, and SMD is sparse, and previous studies have not considered how interest rates might moderate this relationship. Therefore, the focus of this study is to investigate the two components of FCI on the development of the stock market and whether the interest rate moderates this effect.

The primary contribution of this study to the body of the literature is its examination of the moderating role of interest rates in the inflows of foreign capital-led stock market growth. In addition to demonstrating how the interest rate and foreign capital inflows directly affect stock market growth, the study reveals how the link between FCI and interest rates impacts the growth of the Nigerian stock market. This is essential since the effect of foreign capital inflows (FCI) on stock market growth changes depends on the level of interest rates.

Second, while empirical studies have looked at the effects of different economic factors like institutional quality, and financial market development, among others to facilitate the effect of FCI on growth in the literature, there are sparse studies on the role of interest rates in mediating the effect of FCI on the growth of the Nigerian stock market.

Thirdly, to reach a reliable conclusion, this study differs from past studies by taking into account the two components of foreign capital inflows, comprising FDI and FPI, as opposed to aggregating them (Pfeffer, 2008). This is significant because FDI and FPI are the two main types of inflows that are related to the stock market and have different time horizons, and they are anticipated to react differently to changes in economic fundamentals (Tellez-Leon et

al, 2019).

Finally, Autoregressive Distributed Lag (ARDL) is employed to accomplish the study's goals. This strategy is advantageous for the research since it can produce unbiased estimations in the short and long runs in a dynamic setting.

This study's remaining aspect is organized as follows: The literature review is the main focus of Section 2, while methodology, variable measurement, and data sources are covered in Section 3. Section 4 focuses on the findings, while Section 5 offers a final concluding remark.

2.0 Literature Review

2.1. Nexus between Interest Rate and Foreign Capital Inflows

Empirical research has shown that one of the main determinants of the several sorts of foreign capital inflows continues to be the interest rate (FDI and FPI). According to Ayanou (2016), the types and significance of capital inflows affect how sensitive the interest rate is to foreign capital inflows. Following the global financial meltdown in 2008, Broner et al. (2011) hypothesized that foreign portfolio investment inflows (FPI) have grown increasingly due to interest rate differences between the United States and developing nations. According to Pala and Orhan (2015), the deposit interest rate exerts a favourable influence on FPI in Turkey, while Faroh and Shen (2015) concluded that interest rate is an unimportant factor that determines FDI in Sierra Leone. Fornah and Yuehua (2015) established a positive effect of interest rates on FDI in Sierra Leone.

Additionally, Anna et al. (2017)'s analysis supported the negligible effect of interest rates on FDI in Zimbabwe. In Malaysia, Indonesia, and Thailand, Siddiqui & Aumeboonswike (2014) further established a negative relationship between interest rates and FDI. Idowu (2015) found that FPI in Nigeria was low in comparison to other types of investment inflows due to low-interest rates. In their study, the connection between capital inflows and macroeconomic variables in Nigeria, Nwinee & Olulu-Briggs (2016) found that there was a one-way causal link between the rate of interest and FPI, suggesting that FPI is influenced by interest rates in Nigeria.

Ayodele, Afolabi, and Olaoye (2017) looked into how interest rates affected FPI in Nigeria. Their work exhibited that interest rate was a key decisive factor for portfolio investment given the remarkable effect of prime lending rate in the long run. In their study, Ndugbu, Duruechi, and Ojiegbe (2017) looked at the macroeconomic factors that affect FDI in Nigeria from 1986 to 2016. Their findings revealed that real GDP, interest rates, and inflation all exert a positively significant effect on FDI in Nigeria.

2.2 Interest Rates and Stock Market

Both in rich and emerging nations, economists have examined how interest rates and the stock market interact. For 15 advanced and emerging nations, Alam and Uddin (2009) analyzed the correlation between the rate of interest and stock prices. It was discovered that for all of the countries, interest rates have a considerable negative impact on stock prices. The Pakistan stock market index has a negative and considerable influence on interest rates, according to Khrawish et al. (2010). The combined outcome of interest rate and Treasury bill rate on SMD was examined by Addo & Sunzuoye (2013), who found that the influence on SMD in Ghana was negative and insignificant; while Boachie et al. (2016) found an insignificant but positive influence interest rate on Ghana's stock market performance.

According to Toraman and Basarir (2014), Turkey's stock market capitalization and interest rate have a long-term link. They concluded that the uncertain economic climate on the stock market has little bearing on Turkey's long-term interest rate control. Balogun et al. (2016) applied panel data from 1990 to 2013 to investigate the long-term interest rate liberalization effects on SMD in seven chosen Sub-Saharan African nations. Their findings revealed that, on average, liberalizing the rate of interest had an unfavorable effect on SMD over time in the seven chosen SSA countries. In his research, Mahzaheen (2016) found little correlation between interest rates and the stock market. In his research, Khalid (2017) establishes a long-term association between interest rates and exchange rates and Pakistan's stock market capitalization.

He also suggested lowering interest rates to inspire additional investment in the stock market. Khalid and Khan (2017), who conducted their research in Pakistan as well, considered the link between the

macroeconomic variables and the stock market and showed that interest rates exert a considerable negative influence on the stock market. Musawa and Mwaanga (2017) established that a long-run and short-run nexus exists between the stock market index and interest rate in their investigation of the connection between the interest rate and the stock market index in Zambia.

In South Africa, Sin-Yu (2017) examined the macroeconomic determinants affecting SMD and revealed that real interest rates exert a short-term negative influence on SMD. According to Ye and Huang's (2018) research in China on the relationship between the stock price and the Chinese interest rate, a stable cointegration exist over the long run between the variables and a negative correlation between them, while the correlation over the short term showed a positive correlation.

In Nigeria, Akpan and Chukwdum (2014) establish that the influence of interest rates on the Nigerian stock market is meager. In their study of the nexus between monetary policy tools and stock market performance, Odior and Nwaogwugwu (2016) revealed that the monetary policy rate and the total money supply have both long- and short-term influence on stock market performance. The prime lending rate exerts a negative effect on the SMD, whereas the growth rate of the money supply exerts a positive influence, according to Nwokoye & Otu's (2018) investigation of the monetary policy effect on the SMD.

Additionally, Ugwuanyi (2018) revealed in his study on how stock market returns react to variations in monetary policy that the deposit interest rate exerts a negative significant influence on stock market returns in the medium and long term, whereas the broad money supply impact is positively significant. In their 2018 study on how monetary policy affects SMD, Aladejare, Danjuma, and Nyiputen (2018) found that long-term associations exist between the variables, although these financial factors have a negligible short-term impact on SMD. Adekunle, Alalade, and Okulenu (2016) discovered in the macroeconomic pricing variables' effect on the capital market that interest rates exert a negative effect on the expansion of the Nigerian capital market. While Osakwe and Chukwunulu's work (2019) showed that interest rate creates a negative

and minor impact on stock market price changes in Nigeria, Adebawale & Akosile's (2018) study demonstrated that interest rate negatively and considerably impacts SMD in Nigeria.

The results of the study by John, Ezeabasili & Adigwe (2020), on the impact of interest rates on stock market performance in Nigeria, Ghana, and, South Africa, revealed that interest rates exert a negative and insignificant influence on stock market achievement both in the short-term and long-term in Nigeria and Ghana while exerting a negative impact in the short run and positive influence in the long run on stock market performance in South Africa.

2.3. Foreign Capital Inflows and Stock Market

The growth of the stock market and foreign capital inflows (FCI) are theoretically related. Both FDI and FPI were largely associated with the capital market and constituted a sizable share of the inflows to emerging and developing economies. A more disaggregated analysis of these inflows can provide a better understanding of the effect of foreign capital inflows on stock market development. FDI refers to the bodily existence of international enterprises in the local economy via the founding of new businesses or the influx of capital into an already existing business (Obadan, 2012). The amount of resources in a country rises through FDI, which lowers interest rates and makes it easier for firms to get loans to start new ventures or expand the existing ones, which ultimately boosts their profitability (Soumare & Tchana, 2011). When the market is functioning effectively, the effectiveness of listed enterprises or companies may exert a favourable influence on the stock market.

On the other side, FPI in a host economy refers to money and capital market convertible securities, such as equity shares and short- and long-term debt instruments, allotted in the local market by foreign investors that could position the host companies for greater profitability as well as develop the companies' appeal to stock market stakeholders, which results in their significant involvement in the market and ultimately leads to its development. FPI inflows react more quickly to changes in underlying economic conditions (Tellez-Leon & Ibarra, 2019). According to El-Wassal's (2013), foreign portfolio investment inflows continue to be an important tool of stock market growth.

According to the analysis of Chauhan's (2013) on the impact of FCI on the growth of the Indian stock market, FDI has the greatest impact on both the Bombay Stock Exchange and the domestic stock exchange, while FPI has a much smaller influence on the Bombay Stock Exchange and a much higher influence on the domestic stock exchange. In their study in Pakistan on the impact of inflows of foreign capital and economic growth on stock market capitalization, Raza, Syed, and Sahar (2013) discovered that FDI, remittances, and economic growth exert a positive short- and long-term influence on stock market capitalization. Additionally, Malik & Amjad (2013) revealed that FDI had a favourable result on the stock market in Pakistan. Similar outcomes from different research by Agbloyor et al. (2013) and Soumare et al. (2015) underlined the favourable interactions between FDI and SMD.

Meanwhile, a study by Vladimir, Tomislav, and Irena (2013) found no evidence of a long-term association between FDI and Croatian stock market growth. This is comparable to Zafar's (2013) study, which found no evidence of a long-term connection between FDI and SMD in Pakistan. In the study by Nyang'oro's (2013) on the effect of FPI on Kenyan stock market performance, FPI inflows have a delayed but considerable impact on stock returns.

Bayar (2017) analyzed the nexus between FDI, FPI, and remittances; all forms of inflows of foreign capital and SMD in Turkey and establish that FDI affected SMD whereas SMD sparked FPI. In his study on the factors affecting the growth of Ghana's capital markets, Acquah-Sam (2016) found that the Treasury bill rate has a detrimental effect on the market's development while FDI had no impact. In his research, Ramirez (2018) found that FDI influxes had little power on market liquidity and size and a considerable negative effect on the stock market index of 14 emerging economies.

Additionally, Osoro, (2020) discovered that FPI had a negative and negligible influence on Kenya's stock market capitalization while FDI had a detrimental and important effect. From 2008 to 2018, Sajid, Hasshmi, Abdullah, and Hasan (2021) looked at how FCI affected Pakistan's stock market's growth. With the help of many FCI components, including FDI, FPI, and remittances, the outcomes revealed that FDI and FPI had an insignificant long-term impact on

SMD, but that FPI and market capitalization had a positive short-term association and FDI had a negative relationship in Pakistan. On the other hand, Makoni & Marozua (2018) found that there was a causal link between the development of the Mauritius financial market and FDI, FPI, real economic growth, and financial market development over the long term. In their investigation of the dynamic link between macroeconomic factors, stock market returns, and SMD in Ghana, Asravour & Fonu (2020) discovered that both FDI and rate of interest had a long-term beneficial result on SMD.

Several empirical works have looked into the connection between the growth of the Nigerian stock market and FCI. However, the results of the empirical research that is now available are generally contradictory and mixed. On the determinant of FPI in Nigeria, Ekeocha, Ekeocha, Malaolu, and Oduah (2012) demonstrated that FPI provided a positive link to market capitalization in Nigeria. Additionally, according to Eniekezimene's (2013) research, FPI has a positive influence on the increase of the capital market. In their study on how FPI affects the development of the Nigerian stock market, Onyeisi, Odo, and Anoke (2016) found that FPI has a sizable long-term impact on stock market growth. Adebisi & Arikpo (2017), alternatively, looked at the correlation between FPI and financial market performance from 1984 to 2015 and found neither short- nor long-term causal relationships between the two. In his research from 1985 to 2016, Ademulegun (2018) also came to the same conclusion that there was no causal connection between the growth of the Nigerian capital market and FPI.

Conversely, FPI caused a favorable and considerable influence on the growth of the Nigerian capital market, as demonstrated by Oyediran (2015) and Omozuawo & Momoh (2019) in their respective research. Olugbenga & Grace (2015) looked into the FDI impact on the growth of the Nigerian capital market from 1970 to 2010 and revealed that it had a favorable and substantial impact on SMD. In their research from 1970 to 2013, Usman, Ismail, and Sulong (2015) similarly demonstrated a similar outcome of the long-term substantial positive influence of FDI on SMD in Nigeria.

Nwosa (2015) analyzed the link between FCI and stock market growth between 1986 and 2013, using

FDI and FPI as a proxy for capital inflows. The findings exhibited that while SMD had a negligible influence on FDI over the long term; it had a large impact on FDI and FPI in the short term. In his research, Nwosa (2018) found that unidirectional causal links exist between SMD and FPI in Nigeria but no causal link between FDI and SMD. In their research from 1986 to 2016, Adigun, Sakariyahu, and Lawal (2018) found that FCI exerts a strong steady-state connection in the long run with SMD but did not find any proof of a short-run causative relation between FDI or FPI and SMD in Nigeria. In their study of macroeconomic variables and capital market performance in Nigeria, Olokoyo, Ibhagui, and Babajide (2020) showed that rate of interest exerts an adverse influence on capital market performance while foreign capital inflows had a favorable outcome on stock market performance in Nigeria.

It is very clear from the analysis of the existing literature that the previous studies have produced inconsistent and mixed results. Aside from the conflicting and ambiguous results, there is sparse literature on the moderating role of interest in the effect of foreign capital inflows on stock market development. However, few existing studies on the tie between stock market performance and foreign capital inflows have attempted to explain the direct influence of the variables on stock market development among the macroeconomic variables (Acquah-Sam, 2016; Asravor & Fonu, 2020, and Olokoyo, et al, 2020). However, studies have ignored the roles of interest rates in mediating the connection between FCI and stock market growth. This analysis addresses this gap by analyzing how interest rates mediate the effect of FCI on the growth of the Nigerian stock market. This is crucial for the growth of the stock market (Ulke & Barument, 2014).

3.0 Model, Estimation Technique, and Measurement Of Variables

3.1 Model specification

This research work, based on previous studies (Dada & Abanikanda, 2021; Acheampong, 2019; Hoque & Yakob, 2017), used a linear equation to investigate the link between interest rates, FCI, and stock market growth. It also incorporates an interaction term between interest rates and inflows of foreign capital into the model. The model's basic functional relationship is as follows:

$$SMD_t = f(IR_t, FCI_t, X_t) \quad (1)$$

Where SMD_t is stock market development, IR_t is the interest rate, FCI_t is foreign capital inflows composed of foreign direct investment inflows (FDI) and foreign portfolio investment inflows (FPI), and X_t is a set of conditioning control variables frequently applied in foreign capital inflows – stock market literature such as GDP per capita and exchange rate. In specific terms, equation 1 is then stated as:

$$SMD_t = \alpha + \beta IR_t + \delta FCI_t + \lambda X_t + \varepsilon_t \quad (2)$$

To investigate the moderating role of interest rates on different types of FCI on SMD, an interactive term between interest rate and various foreign capital inflows is added to model equation (2) as follows:

$$SMD_t = \alpha + \beta IR_t + \delta FCI_t + \phi (IR_t * FCI_t) + \lambda X_t + \varepsilon_t \quad (3)$$

Where $IR_t * FCI_t$ represents the interaction term between interest rate and different forms of foreign capital inflows. From equation 3, the variables apriori expectations include the following: β is likely to have a negative influence on SMD, δ is anticipated to have a positive and significant effect on SMD. Regarding the interaction term (ϕ) a negative sign hints that interest rate coupled with FCI reduces stock market development. However, a positive sign indicates that interest rate with foreign capital inflows drives SMD in the country. However, insignificant effects of the interaction term (ϕ) suggest that interest rate does not moderate the nexus. The symbol of λ coefficients reckons the impact of control variables on SMD in the model.

3.2. Estimation technique

The Autoregressive Distributed Lag (ARDL) Model is employed to investigate how interest rates moderate the impact of FCI on SMD in Nigeria. The following are some advantages of this technique for this investigation. First, so long that none of the variables are higher than I(1), it can contain both I(0) and I(1) variables (Dada & Abanikanda, 2021). Second, the ARDL bound test makes use of a cointegration method based on the bound test and F- Statistics to verify the presence of long-run equilibrium. Thirdly, the method can be used particularly when the period of the series is small. Lastly, the method also provides unbiased estimates for the short and long runs in a dynamic form.

The ARDL description of Eqn 3 is stated as follows:

$$\Delta SMD_t = \alpha + \sum_{j=1}^p \theta_j \Delta SMD_{t-j} + \sum_{j=0}^p \delta_j \Delta FCI_{t-j} + \sum_{j=0}^p \beta_j \Delta IR_{t-j} + \sum_{j=0}^p \phi_j \Delta (FCI * IR)_{t-j} + \sum_{j=0}^p \lambda_j \Delta X_{t-j} + \chi_1 SMD_{t-1} + \chi_2 IR_{t-1} + \chi_3 FCI_{t-1} + \chi_4 (FCI * IR)_{t-1} + \chi_5 X_{t-1} + \varepsilon_t \quad (4)$$

Where Δ signifies change and stands for the short run changes, χ_j ($j = 1, 2, 3, \dots, 5$) denotes the long run drive, p 's are the utmost lags selected via the Akaike Information Criterion, while ε_t is the error term.

3.3. Measurement, and Sources of Variables

The annual data covering the period from 1986 to 2020 are used. Secondary data on variables like stock market capitalization to GDP ratio as a sign of stock market development (SMD). This measures the market size as the ratio of market capitalization to GDP. Additionally, the study concentrates on two primary inflows of foreign capital which are primarily related to the stock market: foreign direct investment (FDI) and foreign portfolio investment (FPI). FDI is calculated as the FDI to GDP ratio and FPI is also calculated as the FPI to GDP ratio. The prime lending rate is used to measure interest rates. Economic growth (GDP) and exchange rate (ER) are the control variables (X) added to the model. Economic growth is evaluated by the GDP per capita growth rate (Raza & Jawid, 2012; Agbloyor et al. 2016). The exchange rate (ER) is a relative cost that measures how much one currency is worth to another. It is the exchange rate used to convert Naira to US dollars. All the variables are taken from the World Development Indicator (WDI, 2020) edition, and the Central Bank of Nigeria Statistical Bulletin (CBN, 2020)

4.0 Results And Discussion

4.1 Statistical characteristics of the data

Table 1: Descriptive Statistics

	Mean	Median	Maximum	Minimum	Std. Dev	Skewness	Kurtosis
SMD	10.921	9.801	30.801	2.489	6.304	1.272	4.632
FDI	1.878	1.658	5.791	0.195	1.236	1.3351	4.909
FPI	0.219	0.026	2.168	-2.283	0.447	2.732	11.624
IR	18.452	17.586	29.800	10.500	3.816	0.938	4.574
GDP	275306.4	252816.3	385349.0	200317.9	68787.7	0.330	1.436
ER	115.065	120.979	371.000	2.021	100.569	0.809	2.993

SMD is the stock market development, FDI is foreign direct investment inflows, FPI is foreign portfolio investment inflows, IR is the rate of interest, GDP is economic growth and ER is the exchange rate.
Source: Authors' computation, 2022

It is crucial to examine the statistical and economic properties of the data before delving into the influence of interest rates moderating the relationship between FCI and SMD. Based on the results of the descriptive analysis provided in Table 1, the study concludes that there is variation in the variables. Since all the variables' measures of central tendency (mean and median) are quite close together, the variables must have a normal distribution. Except for ER, every variable is skewed to the right and has average values that are higher than the median

values. The average value of SMD as a ratio of market capitalization to GDP is between 2.489 for the minimum and 30.801 percent for the maximum within the data period, with a standard deviation of 6.304. The data also show that FDI inflows were 18.80% of GDP for the period with a standard deviation of 1.236. The FDI ranged from 0.195 (the lowest) to 5.791 (the greatest). FPI inflows as a percentage of GDP were 0.22%, with a 0.447 standard deviation. The FPI ranged from -2.283 to 2.168. A negative FPI value indicated that there were investment outflows throughout the time frame. The GDP per capita, which served as a proxy measure of economic growth, averaged a value of 275306.4 for the time under consideration, whereas the interest rate was 18.45% for the period with a minimum value of 10.50 and a high value of 29.80, and a standard deviation of 3.82 within the sample frame.

The exchange rate generated an average value of 115.07 inside the sample period, with 2.021 minimum values and a maximum value of 371.0. The standard deviation shows that while GDP deviated most from its average, FPI was the variable that remained the most stable during the study. Kurtosis, which measures the distribution's peaks, demonstrates that GDP and ER are platykurtic because their values are less than 3, while SMD, FDI, FPI, and IR are leptokurtic since their values are greater than 3.

Table 2: Correlation Matrix

	SMD	FDI	FPI	IR	GDP	ER
FDI	0.17	1.00				
FPI	0.19	-0.13	1.00			
IR	-0.27	0.35	-0.16	1.00		
GDP	0.13	-0.42	0.47	-0.37	1.00	
ER	0.01	0.47	0.28	0.39	0.82	1.00

Source: Authors' computation, 2022

The degree of correlation between the variables under investigation is shown in Table 2. According to the results, all of the variables—aside from GDP and ER—show a decent relationship with one another, with correlations of less than 0.8 being regarded as the benchmark. This shows that the variables' multicollinearity is neither high nor exact. FPI and FDI are positively correlated with stock market development, whereas interest rates are negatively correlated with SMD, according to the correlation result. The SMD at the time is also positively correlated with both economic expansion and the exchange rate.

The results of the traditional unit root test are shown in Table 3. According to the traditional Augmented Dickey-Fuller (ADF) unit root test, the outcome displays the combination of I(0) and I(1) of the variables. The Phillips-Perron (PP) unit root test, in addition to the ADF test, determines the degree of stationarity of the variables. The results of the PP tests show that there were both I(0) and I(1) variables. The mixing of I(0) and I(1) variables makes the use of autoregressive distributed lag (ARDL) as the estimating method appropriate.

Table 3: Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) Unit Root Tests

Variables	ADF			PP		
	Level	First Diff	Status	Level	First Diff	Status
SMD	-3.0659**		I(0)	-3.0971**		I(0)
FDI	-2.1934	-8.0322***	I(1)	-3.3934**		I(0)
FPI	-3.2632**		I(0)	-3.1266**		I(0)
IR	-4.2547***		I(0)	-4.5010***		I(0)
GDP	-1.5813	-2.9275*	I(1)	-0.7411	-2.7611*	I(1)
ER	-1.9045	-3.7952**	I(1)	2.1198	-3.7311***	I(1)

(1) Critical values are at 1%: - 3.64, 5%: - 2.95, 10%: - 2.61

(2) The lags length is chosen automatically premise on the optimal lag length selection of the AIC criteria

(3) ***, **, * symbolize 1%, 5%, and 10%, respectively

Source: Authors' computation, 2022

4.2: The Moderating Impact of Interest Rate in the Foreign Capital Inflows-Stock Market Development Nexus

Under the null hypothesis that there is no long-term relationship, Table 4 presents the results of the ARDL bounds test cointegration. The development of two models with two distinct types of foreign capital inflows (FDI and FPI). Model 1 shows how interest rates and FDI interact directly and indirectly on the SMD, whereas Model 2 shows how interest rates and FPI interact directly and indirectly on the SMD. The primary aim of this study is to ascertain how interest rates relate to the relationship between FCI inflows and the growth of the Nigerian stock market.

The results of the ARDL bound testing in Table 4 shows the evidence of a long-term nexus between the variables. The F- statistics value exceeds the upper bound critical value at a distinct level of significance. This shows a long-term relationship between the variables. The evidence suggests that variables must eventually converge from the short run to the steady state. Therefore, the null hypothesis that there is no long-term relationship between the variables is rejected.

Table 4: ARDL Bound Test (Dependent Variable: (SMD))

	MODEL 1		MODEL 2	
F-Stat	4.21**		5.66***	
Critical value Bonds:				
	I(0)	I(1)	I(0)	I(1)
1%	3.41	4.68	2.82	4.21
5%	2.62	3.79	2.14	3.34
10%	2.26	3.35	1.81	2.03

***, **, * indicate significance at 1%, 5% and 10% respectively.

Source: Author's computation, 2022

4.2.1 Short-run dynamics

After it has been established that there is a long-term relationship between the variables, Table 5 presents the results of the estimation of the short-run coefficients of error correction using the ARDL framework. As shown, the error-correction terms (ECT) in the ARDL models 1(1,2,2,2,0) and 2(1,0,0,0,3,0) are significant at the 1% level of significance for model 1 (-0.9175) and model 2(-0.7837), respectively. This reaffirms the ARDL bounds testing-supported long-term relationship between the variables. These coefficients define the speed at which each period's distortions and divergences caused by shocks are corrected to a steady and dynamic equilibrium. The results show the relative importance of long-run versus short-run dynamics as well as the rate of change or convergence to the equilibrium state one year following a shock.

The results of the ARDL in model 1 short-run estimate version show that while the coefficient of FDI lag 1 is negatively significant, the present parameter estimate of FDI is negative and insignificant. According to the result, FDI inflows do not have a significant effect on stock market development. The same is true for model 2, where the results show that the current FPI coefficient is negative and significant; supporting the claim that FPI has a detrimental effect on SMD in Nigeria. The disappointing outcomes of both FDI and FPI suggested that the presence of these inflows does not produce a positive short-term spillover effect on SMD. The findings of this study support those of other studies (Raza et al., 2014; Ademulegun, 2018; Sakariyahu & Lawal, 2018; Sajid et al., 2021), which discovered that FDI and FPI had a short-term, significant detrimental effect on SMD.

The current level and lag 1 of the interest rate are shown to be negative and significant, respectively, by the short-run coefficient estimate of the interest rate in

model 1. As a result, the idea that SMD and the current interest rate are related negatively is not disproved. The short-run positive significance of SMD is revealed by the current coefficient of interest rate in model 2.

The interaction between interest rates and FCI on the country's SMD has a positive and statistically significant short-run coefficient. The coefficients of lag 1 of model 1 are positive and statistically significant at a 1% level, in contrast to the positive but unimportant coefficients of lag zero (0) of model 1. This shows that the power of interest rates transforms the immediate negative effects of FDI into immediate positive effects on SMD. According to this finding, Nigeria's interest rate provides the necessary support and assistance to increase FDI inflows' efficacy, which will subsequently hasten the short-term growth and development of the stock market.

Also in model 2, the short-run coefficient of the interactive term is significantly positive at a 5% level of significance. This infers that the positive influence of interest rates changes the negative impact of FPI to ensure a favorable positive short-term impact on SMD. This suggests, however, that despite the direct and adverse influences of both FDI and FPI on SMD, the study findings reveal that the effect of interest rates attracts the growth benefits of both inflows on SMD in the short run.

Furthermore, both models' short-run economic growth coefficients, as measured by GDP per capita, produced erratic outcomes. In model 1, the estimate of the coefficient for lag 0 is significant and positive, but the coefficient for lag 1 is substantial and negative. The coefficients' sum is positive (0.3296) and significant at the 5% level. This shows that steady economic growth is a positive factor in the enhancement of stock market performance and future growth possibilities. These findings are consistent with research by Choong et al. (2010), Raza et al. (2014), Hoque and Yakob (2017), and Olokoyo et al. (2020), which found that stock market capitalization is boosted by economic growth. The coefficient of lag 1 is negative and significant in model 2, but the coefficients of lag 0 and lag 2 are positive but unimportant. At a 5% level of significance, the parameter estimates add up to a negative value (-2.4367), which is significant. The exchange rate coefficients are also negative and

substantial in both models. In the short run, SMD in Nigeria is negatively impacted by both exchange rate coefficients. This shows that depreciating exchange rates result in more stock market success. This finding is consistent with earlier research (Raza et al. 2012;

Musa & Ibrahim 2014). This further demonstrates how exchange rate depreciation may encourage and pull inflows of foreign capital into the economy and later have a positive impact on the growth of the stock market.

Table 5: Estimated Short-run and Long-run Coefficients using ARDL Model
Dependent Variable: Stock Market Development (LSMD)

Variable	Model 1: FDI*IR (1, 2,2,2,2,0)			Model 2: FPI*IR (1,0, 0, 0, 3, 0)		
	Coeff	t-stat	Prob	Coeff	t-stat	Prob
<i>Short-run Estimated coefficients</i>						
LSMD(-1)	0.08251	0.4281	0.6737	0.2163**	(2.2308)	0.0357
Δ (FDI)	-0.0311	(-0.1463)	0.8853			
Δ (FDI(-1))	-0.6273***	(-3.4832)	0.0027			
Δ (FPI)				-2.1892*	(-1.9968)	0.0578
Δ (IR)	-0.0531**	(-2.7627)	0.0128	0.0899***	(6.0466)	0.000
Δ (IR(-1))	-0.0562***	(-5.0897)	0.0000			
Δ (LGDP)	4.0521**	(2.8041)	0.0117	3.1410	(1.4426)	0.1626
Δ (LGDP(-1))	-3.7225**	(-2.6024)	0.0180	-9.0728**	(-2.9760)	0.0068
Δ (LGDP(-2))				3.4951	(1.3078)	0.2039
Δ (LER)	-0.4891***	(-3.2702)	0.0043	-0.4887***	(-4.7638)	0.0001
Δ (FDI*IR)	0.0015	(0.1516)	0.8812			
Δ (FDI*IR(-1))	0.0275***	(3.3248)	0.0038			
Δ (FPI*IR)				0.1327**	(2.0860)	0.0483
ECT(-1)	-0.9175***	(-6.4451)	0.000	-0.7837***	(-8.0807)	0.000
R ²	0.7652			R ²	0.6982	
Adj.R ²	0.5827			Adj.R ²	0.5933	
<i>Long-run Estimated coefficients</i>						
FDI	0.4587**	(2.5479)	0.0202			
FPI				-2.7936*	(-2.0423)	0.0528
IR	0.0030	(0.1659)	0.8701	-0.0717***	(-9.3706)	0.000
LGDP	1.0529***	(3.7667)	0.0014	0.7639***	(13.0900)	0.000
LER	-0.5331***	(-4.1077)	0.0007	-0.6237***	(-7.2470)	0.000
FDI*IR	-0.0202**	(-2.0832)	0.0518			
FDI*IR		(2.0832)		0.1693**	(2.1212)	0.0449

The Akaike Information Criterion was employed to select the number of optimal lag lengths which was accepted to estimate short and long-run coefficients, t-statistics are in the bracket; *, ** and *** signify 10%, 5%, and 1% significance levels respectively

Source: Author's computation, 2022

4.2.2. Long-run Dynamics

Table 5 displays the long-run estimations of the variables from the two ARDL Models. The long-run coefficient results show that FDI has a favourable positive impact on SMD throughout the study. It suggests that FDI has a big role in the growth and development of the domestic stock market. The positive impact of FDI inflows will boost the effectiveness of the receiving nation through a variety of means, such as technology transfer, increased

domestic rivalry, contribution to global trade integration, and consequently, growth of the stock market.

On the other hand, the long-run coefficient estimate of FPI inflows shows an adverse impact on SMD. This suggests that, in addition to maximizing profits, FPI investors are passive in the stock market to the extent that they can reduce risks by distributing their investment across other sectors that offer high returns,

which will increase uncertainty in the performance of the stock market in the country. In model 1, the coefficient of interest rate shows a positive, negligible effect on SMD, whereas, in model 2, the coefficient of interest rate shows a negative, significant effect on SMD over time.

Despite the long-run coefficient of FDI indicating a direct strong and positive significant influence on SMD, the estimate of the interaction of interest rate and FDI shows a negative and significant effect on SMD. This finding suggests that interest rates do not encourage FDI growth benefits to enhance the development of the domestic stock market, over the long term. It shows that the impact of FDI inflows has been mitigated over time by the effect of interest rates.

Despite the long-run coefficient of FPI inflows indicating a direct and large negative influence on SMD, the estimate of the interaction between FPI and interest rate in Model 2 demonstrates a positive and significant impact on SMD in Nigeria. This result shows that investors increased their support for the long-term growth advantage of FPI on SMD as a result of interest rate adjustments. It implies that the interest rate has a positive impact and validates the effectiveness of FPI in promoting SMD's growth. The findings also show that encouraging and attracting FPI, which will ultimately have a positive influence on SMD in Nigeria, requires a better interest rate.

Estimated long-term economic growth coefficients have a positive and significant long-term effect on SMD. This is proof that the nation's long-term stock market growth has been affected by economic growth. The long-run exchange rate coefficients in both models are statistically significant and negative

at a 1% level of significance. This illustrates how a decline in the currency rate eventually translates into better stock market performance, which, in turn, promotes the long-term expansion of SMD in Nigeria.

4.2.3. Diagnostic Tests

The robustness checks are investigated to determine the accuracy of the estimates once the ARDL estimates for both models have been established and discussed. The two model estimates' goodness of fit was confirmed by the R² and adjusted R² figures in the table. Jarque-Bera statistics showed that the error term in model 1 is normally distributed; whereas model 2 showed that it is not significant, suggesting that FPI is more volatile. The Breusch-Godfrey serial correlation LM test confirms that no serial correlation exists in the two models.

Additionally, the Breusch-Pagan-Godfrey test in the two models supports the absence of heteroskedasticity. The coefficient of the Ramsey reset test shows that neither of the models has any error specification.

In conclusion, these tests show that the estimated parameters are reliable and authentic. Additionally, both models validate the stability of the error-corrected ARDL parameter stability using the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMQ) to the recursive residuals, as the line is within 5% of the critical line.

Table 6: Diagnostic and Model Stability Tests

	Model 1(FDI)		Model 2(FPI)	
	F-stat	Prob	F-stat	Prob
Jarque-Bera normality test	0.3391	(0.8440)	6.5745	(0.0374)
Serial Correlation LM test:	0.6930	(0.4775)	0.0558	(0.9458)
Heteroskedasticity test:	0.4142	(0.9501)	0.5921	(0.7897)
Ramsey RESET test	2.1694	(0.1591)	1.3803	(0.1814)

Source: Author's computation, 2022

Figure 4.1: Stability Test of ARDL Model 1

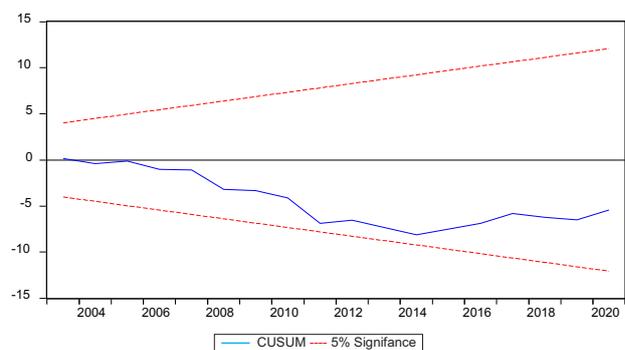
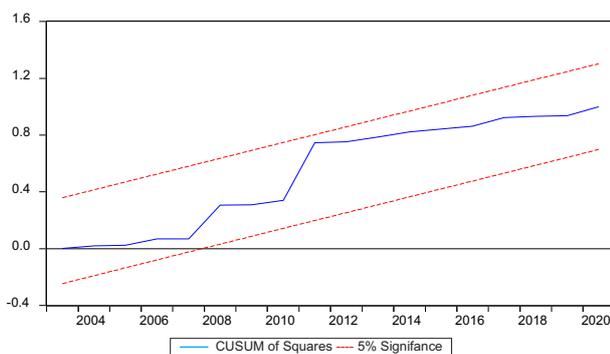
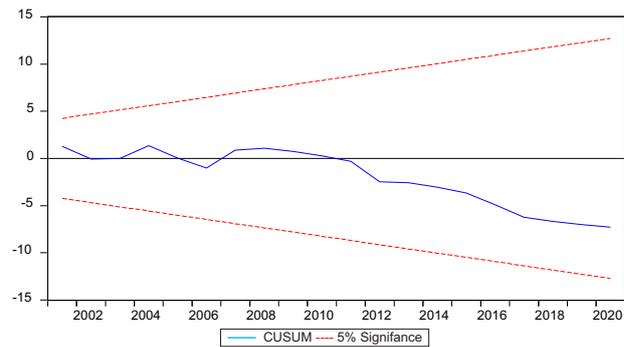
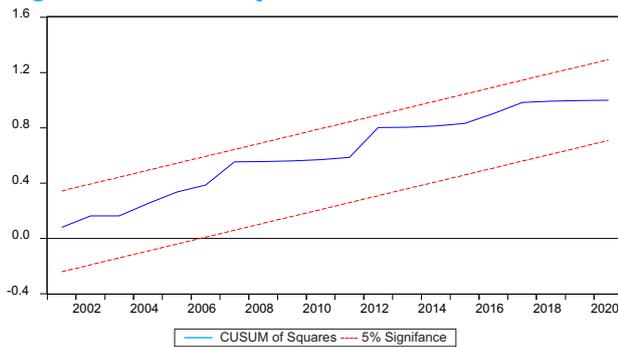


Figure 4.2: Stability Test of ARDL Model 2

5.0 CONCLUSION

The moderating impact of interest rates on the relationship between FCI and the growth of the Nigerian stock market from 1986 to 2020 is investigated in this study. By employing Autoregressive Distributed Lag (ARDL), this analysis deviates from earlier studies on the direct impact of FCI on the growth of the Nigerian stock market by revealing the moderating role of interest rates in the link.

The study's findings provide new insight into the conflicting facts regarding the development of the Nigerian stock market and FCI in several ways. First, the analysis demonstrates that while FDI and interest rates both have short-term detrimental effects on SMD, they both have significant long-term beneficial effects. The findings indicate that while the interaction between the factors has a large positive impact on SMD in the short run, it has a significant negative impact on SMD over the long term. This implies that interest rates enhance the effect of FDI on SMD in the short term, while it reduces the impact of FDI inflows on SMD in the long run.

The results also reveal that SMD is negatively impacted separately and directly by both interest rates and foreign portfolio investment (FPI) inflows over long and short periods. This implies that the FPI is not being used effectively to assist the growth of the domestic stock market. However, the interaction between the two factors shows a favorable impact on SMD in Nigeria over the long and short terms. This implies that the interaction between interest rates and FPI stimulates the expansion of the stock market. The

FPI is boosted by interest rates, which significantly affects SMD nationally over the period under consideration.

The findings of this study indicate that Nigeria's policies will need to change over the long and short terms. To increase FCI and assure an influence on the nation's stock market, it is necessary to simultaneously implement a better interest rate plan. To positively affect the country's stock market, interest rates, and foreign capital inflows depend on one another.

This study has added to the body of existing studies on the connection between FCI and the development of the Nigerian stock market and the moderating effect of interest rates on how foreign capital affects Nigerian SMD that has not been considered in other studies.

Interest Conflicts

Author(s) declare(s) that there is no conflict of interest concerning the publishing of this paper and certify that the submission is original work and is not under review at any other publication.

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Author (s) Contribution

Both the Authors contribute in writing and proofreading the study on the nexus between foreign capital inflows and stock market development in Nigeria: Does interest rate matter?

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Corruption and Bank Performance in Africa: Revisiting the Greasing-the-wheel and Sanding-the-wheel Hypothesis



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Abstract

Corruption has been a major challenge in most African countries. The argument of whether banks are the greatest beneficiaries or victims of corruption in Africa stimulated the interest to investigate the effect of corruption on bank performance in Africa. The entire banks with operational presence in Africa between 2010-2022 formed the study's population. The final sample was restricted to the top 200 banks in Africa in size, profitability, and assets. Secondary data was utilised with data from the BankFocus database, World Development Indicator and Transparency International. The estimating method used was the System Generalized Method of Moment. The results showed that corruption (P-value 0.0449, Coefficient -0.01078 for ROA & P-value 0.030, Coefficient -0.0628 for ROE) negatively and considerably impacts bank financial performance in Africa. The study, therefore, concluded that since corruption has an unfavourable effect on the banking industry's performance, it does not grease-the-wheel of banks but, rather, sand-the-wheel of banks in Africa. This study, therefore, recommended that leaders of African nations put appropriate measures in place to stem the tide of corruption and every form of corrupt practices in their respective countries.

Keywords: Corruption, Africa, GMM, Banks Performance.

1.0 Introduction

The bank's capacity to provide the capital required for economic activity makes it one of the most significant sources of long-term and short-term financing for individuals, businesses and governments. Banks are particularly crucial for economic growth in emerging nations where financial markets are expanding. The main formal body that people and businesses seem to resort to for financing to support their growth appears to be banks (Aluko & Ajayi, 2017; Beck & Cull, 2013).

Banks provide critical services to encourage economic development in most nations (particularly emerging markets). Banks' maturation may significantly influence how financial resources are dispersed to emerging continents such as Africa. Because of the lack of growth in the capital markets, banks continue to be the most important source of private financial assets for enterprises (Levine, 2005). A healthy banking industry is better positioned to withstand negative shocks and contribute to the financial system's stability. As a result, academics, bank management, financial markets, regulators, and investors have been drawn to topics that may boost bank financial performance (Athanasoglou et al., 2008).

The issue of corruption has been a major issue in most African countries. The data released by Transparency International for 2021 (CPI, 2022) shows that corruption is still a major challenge in most African countries. Some of the largest markets in Africa, like Nigeria, South Africa, Egypt, and Morocco, among others., ranked poorly in terms of corruption. The idea that certain banks create provisions for loans to nonexistent persons or firms, leaving banks with nonperforming loans, is compatible with corruption in the banking industry (Abuzayed et al., 2024; Lizal & Kocenda, 2001).

The accumulation of nonperforming loans has a long-term impact on bank financial performance and, in some cases, the failure of these institutions. This, in turn, may impair private investment productivity and, as a result, economic growth. Speculators' assumptions and manipulation of share prices in financial markets to deceive investors might also be considered corruption (Bolarinwa & Soetan, 2019). Studies (Abuzayed et al., 2024; Asteriou et al., 2021; Aburime, 2011; Okereke &

Kurotamunobarami, 2016) have examined how corruption affects the performance of banks. While the studies reported mixed findings based on their studies' geographical scope, there is a need to investigate further how high or low corrupt tendencies would impact the performance of banks within the country. In addition, studies on how corruption could affect bank performance in Africa are relatively scarce. The few studies (Aburime, 2011; Okereke & Kurotamunobarami, 2016; Abosedo, 2011; Anaere, 2014; Junghee, 2012) are country-specific studies, hence the need to examine how corruption could impact the performance of banks from an African perspective. The report of Transparency International indicated that corruption is a major problem in Africa. The unanswered question is whether the banks operating in Africa benefit positively (greasing-the-wheel) from the highly corrupt tendencies prevalent in Africa or whether it is negatively affecting their performance (sanding-the-wheel).

Consequently, this study aims to add to the body of knowledge by investigating how corruption affects African banks' financial performance. Since the African banks have undergone significant changes over the past three decades yet are still unable to compete well with their European counterparts, there is need to pay close attention to greasing-the-wheel and sanding-the-wheel postulations (Oladele, 2021). Thus, there is a need to examine if corruption is one index limiting the profitability of banks in Africa.

2.0 Literature Review and Theoretical Framework

The framework for this study was based on the postulation formulated by Wei in 1998, otherwise known as the Greasing-the-Wheel and Sanding-the-Wheel Hypothesis. This postulation can be utilised to examine the correlation linking corruption and bank performance in Africa. This hypothesis suggests that corruption is not only compatible with progress, but it may also facilitate it. It argues that all forms of corruption can positively impact economic and political growth (Axel & Martin, 2013).

According to this hypothesis, bribes often act as a "grease" to overcome bureaucratic obstacles and enhance efficiency in business and trade. Additionally, Charumilind et al. (2006) and Mongid

and Tahir (2011) argue that corruption allows firms and influential individuals to obtain loans without having to meet stringent loan conditions in highly corrupt environments. Similarly, Abuzayed et al. (2024) agrees that while corruption may increase bank lending, it does, however, have a negative effect on bank performance.

Similarly, the studies conducted by Arshad and Rizvi (2013) and Bougatef (2017) demonstrated a favourable connection between corruption and bank performance. They concluded that this relationship underscores how banks can benefit from corrupt practices. The study of Asteriou et al. (2016) relied on data from European banks. It concluded that corrupt practices like unethical behaviours, share price manipulations and outright embezzlement contributed significantly to bank distress and failures. Consequently, they established that corruption does not "grease-the-wheel" of banks but rather "sands-the-wheel" of banks.

Weill (2011) and Lalountas et al. (2011) agreed that corruption might initially boost bank lending and profitability in the short run, especially in risk-averse banking sectors. However, contrary findings were reported in the study of Oladele (2021). This study found that corruption increases the likelihood of bad debt in a bank's portfolio, negatively impacting profitability. Similarly, Asteriou et al. (2021) also established that corruption and transparency have a negative and significant effect on bank performance. Williams and Martinez-Perez (2016) demonstrated that corruption arises from government institutions' inefficiencies, allowing entrepreneurs to exploit these inefficiencies for personal gain.

Anaere (2014) and Junghee (2012) discovered comparable findings, demonstrating that corruption has a negative impact on bank performance in terms of revenue loss, a rise in nonperforming loans, and an inability to contribute to economic growth effectively. As a result, they established that corruption impedes bank lending and, as a result, impacts overall bank performance. Jayasekara et al. (2020) emphasised that the efficiency of banks is dependent on its ability to guide against unethical practices.

While relying on data from Nigeria, some studies (Yarosan, 2013; Abosedo, 2011; Aburime, 2009;

Okereke & Kurotamunobarami, 2016) reached the same conclusion on the role of corruption and every other form of corrupt practices on bank performance. They argued that corrupt practices like unethical practices and financial crime hinder the development of the banking activity and the entire financial sector. These unethical actions can lead to an increase in nonperforming loans and higher costs of credit allocation.

The study by Umeh et al. (2013) could not establish any beneficial effects corruption has on the banking sector and the economy. Instead, their findings revealed that corruption is one of the major drivers of bank failure and distress. However, the study of Dreher and Martin (2013) reported a different finding. They established that corrupt practices, such as "greasing the wheel," can stimulate business growth by reducing barriers to expansion, particularly in regulated markets.

Consequently, this study put out the hypothesis that corruption does have a detrimental (sanding-the-wheel) impact on bank performance in Africa, in line with the findings from the literature.

3.0 Methodology

An ex post facto was employed as the research design for the study. The data employed for the study was sourced from Transparency International, the World Development Indicator, and the Bank Focus database. The study population consisted of banks with a presence in Africa. Due to data limitations, the sample size was restricted to 200 banks. The selected banks were ranked as the top 200 African banks in terms of assets, deposits, and income in 2022 by the African Report Magazine. The selected banks operate in 33 out of the 54 African countries. The value of the sample banks had been converted to dollars, thus removing exchange rate discrepancies. The final sample is an unbalanced panel dataset of 200 banks from 2010 to 2022.

For the purpose of analysing how corruption affects bank financial performance, this study adapted the dynamic and unbalanced panel model of Oladele's (2021) and Oladele and Sanni (2022) examinations of bank performance. Two models were also developed for the investigation. The first model used return on asset (ROA) as a proxy for bank financial performance. The second model substituted return

on equity for bank performance.

The original model of Oladele (2021) is stated as follows:

$$ROA_{it} = \alpha + \beta_0 + \beta_1 ROA_{it-1} + \beta_2 EF_{it} + \beta_3 ISTQ_{it} + \beta_4 BF_{it} + \beta_5 MF_{it} + \beta_6 FF_{it} + \beta_7 + \beta_8 INF_{it} + \beta_9 GDP_{it} + \beta_{10} FDI_{it} + \mu_i + \varepsilon_{it}$$

The model was modified by removing variables like economic freedom (EF) and others that are not relevant to for this study. The modified model is stated as follows:

$$ROE_{it} = \alpha + \beta_1 ROE_{it-1} + \beta_2 COR_{it} + \beta_3 INF_{it} + \beta_4 GDP_{it} + \beta_5 FDI_{it} + \mu_i + \varepsilon_{it}$$

The second model is stated as follows

$$ROA_{it} = \alpha + \beta_1 ROA_{it-1} + \beta_2 COR_{it} + \beta_3 INF_{it} + \beta_4 GDP_{it} + \beta_5 FDI_{it} + \mu_i + \varepsilon_{it}$$

Where:

- α : constant term,
- ROA: Return on Asset,
- ROA_{it-1}: One year lag of return on asset,
- ROE: Return on Equity,
- COR: Corruption,
- INF: Inflation Index
- GDP: Gross Domestic Product Index
- FDI: Foreign Direct Investment Index
- μ_i : Unobserved effect,
- ε_{it} : error term,
- β_{1-5} : coefficient of estimated parameters,

The one-year lag of the dependent variable was included as a regressor in the model to introduce dynamism into the model. Literature (Asteriou et al., 2016; Oladele, 2021; Oladele & Sanni, 2022) have established that banks' prior performance has the capacity to influence future performance. Similarly, a second proxy (ROE) was employed to measure bank performance. This proxy was equally regressed on the regressors. The justification for employing two different proxies to measure bank performance is to examine if the effect of corruption on bank performance would provide a consistent outcome among the different proxies of bank performance. ROA and ROE are among the most popular proxies employed to assess bank financial performance. Inflation, GDP, and FDI were incorporated into the model because empirical evidence (Oladele & Sanni, 2022; Umeh et al., 2013 & Oladele, 2021) have established their capacity to influence bank financial performance.

The study utilises descriptive and inferential statistics as the estimation technique. The descriptive statistics used the mean, minimum, maximum, and coefficient

of variation. However, the System Generalized Method of Moment (SGMM) was used to estimate inferential statistics. Due to the one-year lagged value in the regressor, the SGMM is a very outstanding fit for the study because it takes into account the unobserved effect. In addition, the SGMM is designed for panels with a large cross-sectional sample and few time-series data per participant (Arellano & Bond, 1991). When used with panel data models, it takes into account measurement errors, misplaced variables, and any explanatory factors that are likely to be endogenous.

4.0 Results and Discussion of Findings

Table 1: Descriptive Statistics

Variable	Observation	Mean	Std. Dev.	Coe. of Var.	Minimum	Maximum
ROA	1,428	2.2361	2.3821	1.0652	-7.82	27.94
ROE	1,429	17.952	16.0964	0.8967	-167.50	155.40
COR	1,328	35.0483	10.3298	0.2948	11	65
INF	1,410	6.5260	5.7790	0.8857	-2.3	41.8
GDP	1,414	3.5032	3.5796	1.0219	-62	13.607
FDI	1,428	2.5667	4.1373	1.6119	-6.3698	39.4562

Source: Author's Calculation (2023).

Table 1 displayed the summary statistics for the study's dependent, independent and control variables. The sampled banks were, on average, relatively profitable in the years under consideration, according to the result of the ROA, with a mean score of 2.2361. The significant disparity between the minimum and maximum values of -7.82 and a maximum value of 27.94 demonstrated that while some banks have reported a significant improvement in their financial performance, others have seen a sharp decline in their profitability within the year under consideration. The standard deviation value of 2.3821 indicated that the ROA volatility level within the period considered is relatively low. The mean score of 17.952 indicated that ROE had a much higher average than ROA. The results showed that the bank shares' value improved significantly higher than their profitability within the year under review. However, the standard deviation value of 16.0964 showed that the share price and returns were more volatile, especially when compared to the bank's profitability. Factors like mergers/acquisitions, takeovers and share buy-backs may have accounted for the level of volatility reported in the finding.

The mean value for corruption is 35.0483. This score was below the global average of 50, which suggested that corruption is still a significant challenge in Africa. As a result, corruption presents a significant concern

in the nations under review. The standard deviation value of 10.3298 showed the level of volatility of corruption within the years under consideration. The significant difference between the minimum and maximum value for corruption showed that corrupt practices are not the same in African countries. With a mean score of 6.5260 for the period under consideration, inflation may be considered to be modest within the year under review. However, it is crucial to keep in mind that the distribution of inflation rates varies across various countries. The levels in each country varied significantly, especially for the year under consideration, with a minimum score of -2.3 and a maximum score of 41.8. The standard deviation of 5.7790 further demonstrated that the level of volatility is relatively modest.

The GDP score on average is 3.5032, indicating that there is modest growth within the period under review. The GDP growth of the countries in the years under consideration was not spread fairly, with the lowest score of -62 and the highest score of 13.607, respectively. The average score for FDI is 2.5667. There is, however, a significant difference between the minimum value (-6.3698) and the maximum value (39.4562). This indicates that while some countries in Africa had witnessed a significant FDI inflow, others saw a significant outflow of foreign investments in their countries. The FDI has the highest coefficient value (1.6119), indicating a large variation in FDI in Africa. Inflation, however, has the lowest coefficient value of 0.8857, which shows that there is minimal variation in the inflation index of Africa.

Table 2: Multicollinearity Test

VARIABLES	VIF	1/VIF
COR	3.73	0.2674
INF	1.50	0.6667
GDP	1.28	0.7813
FDI	1.10	0.9091
Mean VIF		

Source: Author's Calculation (2023).

Multicollinearity is categorised as a phenomenon in which a variable in a model may be linearly predicted from other variables with a high degree of accuracy, indicating that they are highly connected. The variance inflation factor (VIF) can be employed to identify the presence of multicollinearity among the independent variables. The VIF rule of thumb indicates that the VIF test output must be less than 10 to show that the variable is not substantially collinear

(Gujarati, 2007). Table 2 estimates showed that the independent variables of the regression model have a VIF value of less than ten and a mean score of 1.90, so multicollinearity is not likely to be a problem.

Models Estimation

This study used the Generalized Method of Moments (GMM) estimator, a two-step methodology. This estimate is true if the Arellano-Bond (AB) test for serial correlation fails to exclude the possibility of first-order serial correlation [AR (1)] while doing so without excluding the possibility of second-order correlation [AR (2)]. To verify that the instruments used are orthogonal to the error term and can support their validity, the Hansen test must also accept the over-identification limitation hypothesis. Additionally, it is critical to keep the number of instruments under the total cross-sections (banks) in order to minimise instrument proliferation.

Table 3: System GMM Estimation Result

	Model 1 DV = ROA _{t-1}		Model 2 DV = ROE _{t-1}	
	Coefficient	P-value	Coefficient	P-value
Constant	1.6638	0.004***	13.1341	0.000***
DV	0.26193	0.001***	0.2855	0.018**
COR.	-0.01078	0.049**	-0.0628	0.030**
INF	0.03960	0.046**	0.1777	0.040**
GDP	0.02967	0.046**	0.1571	0.120
FDI	0.02277	0.321	0.3169	0.094*
Model Diagnostics				
AR (1) Test	-2.15	0.032**	-3.12	0.001***
AR (2) Test	1.43	0.152	1.27	0.223
Wald χ^2	34.24	0.001***	34.98	0.001***
Hansen J- Test	0.68	0.407	0.08	0.757
Number of Observations	1428		1429	
Number of banks	200		200	
No of instruments	8		8	

Note: DV denotes a one-year lagged dependent variable while ***, **, and * indicated significance levels at 1%, 5%, and 10%, respectively.

Source: Author's Calculation (2023).

The one-year lagged ROA has a positive and statistically significant coefficient in the regression result in Table 3, which supports the model's dynamic character. The study gave statistical support to the claim that banks' previous performance has a big impact on how they function now and in the future. The corruption (COR) coefficient is statistically significant and negative (-0.01078). This suggests that in Africa, corruption has a detrimental impact on bank financial performance, thus negating the greasing-the-wheel hypothesis, which postulates that banks tend to benefit from a highly corrupt system. The findings further inferred that the relationship between corruption and bank performance in Africa is inverse. As corruption and other unethical practices increase, bank performance declines significantly.

This may be attributed to the significant loss of revenue that could have contributed to the improvement in bank performance.

The African country's inflation has a favourable and statistically significant impact on the financial performance of banks. The research emphasises banks' potential to profit from inflation and suggests that banks operating in African continents are more likely to benefit from strong inflationary tendencies. This may be attributed to the possibility of businesses assessing more credit facilities during a high inflationary trend. In Africa, GDP positively and statistically significantly impact banks' financial performance. The result suggested that when national GDP rises, so does bank performance. This may be because the economy has generally improved, and people and corporate organisations have expanded their enterprises and raised their standard of living. In Africa, FDI has little impact on the financial performance of banks.

The finding showed that banks' financial performance would not be impacted regardless of the countries' FDI changes. The study also suggests that there is a negative correlation between corruption and bank financial performance. When corruption increases, bank financial performance decreases, and vice versa. This could be due to banks losing potential revenue that could have positively impacted their financial performance if corruption was effectively controlled. The overidentifying constraints of the null hypothesis are not refuted since the Hansen J statistic is not statistically significant. This suggests that the tools employed to estimate the model are reliable. A good fit is shown by the Wald χ^2 , which showed that the model is statistically significant at the 1% significance level.

For model two, the regression result revealed a positive and statistically significant coefficient for the one-year lagged value of ROE (0.2855, P-value 0.018). The output's statistical significance supported the claim that banks' previous financial attainment greatly impacted their current and future performance. The outcome also provided statistical support for the regressor's dynamic nature. Corruption (COR), like in the first model, has an unfavourable and statistically significant impact on banks' financial performance in Africa. This demonstrated that there is a negative correlation

between corruption share growth and returns. The performance of banks declined with the rise in corrupt practices. The results aligned with what is obtainable when ROA is employed to measure bank performance. At the 1% significance level, the first-order autocorrelation null hypothesis is rejected, whereas the second-order autocorrelation null hypothesis is not. The null hypothesis of overidentifying limitations is not rejected since the Hansen J statistic is not statistically significant.

This suggests that the tools employed to estimate the model are reliable. The model also has an excellent fit, as the Wald χ^2 shows statistical significance at the 1% significance level. On both bank performance measures, corruption had a consistent and negative effect on bank performance. This consistency of the findings among the two proxies of bank performance is an indication that corruption does not in any way grease-the-wheel of banks in Africa but rather sand-the-wheel of bank progress.

Nevertheless, when compared to what was obtainable in the first model, corruption has a greater impact on ROE (-0.0628). The higher coefficient value indicates that a bank's ROE may be negatively impacted more than ROA. For the control variables, the financial performance of banks is only favourably and statistically substantially influenced by FDI. This suggests that as FDI grows, so do banks' financial results. However, neither GDP nor inflation greatly impacts how well banks perform financially.

The results demonstrated that corruption significantly negatively impacts banks' financial performance. This suggests that corruption and bank financial success are inversely related. As corruption increases, bank financial performance deteriorates.

The findings, however, aligned with the study

hypothesis but negated the greasing-the-wheel hypothesis. The consistent results from the two measures of bank performance on the effect of corruption is an indication that corruption impedes banks' financial performance in Africa. That is, instead of greasing-the-wheel, it sand-the-wheel. The finding is consistent with the findings of Oladele (2021) Bolarinwa and Soetan (2019), and Yaroson (2013) that fraud and other form of corrupt practices reduces the banks' overall effectiveness and financial performance. The results, however, contradicted the findings of Mongid and Tahir (2011), Lalountas et al. (2011), Weill (2011), Arshad and Rizvi (2013), and Bougateg (2017), who found a positive correlation between corruption and bank performance. They argued that banks occasionally profit from a corrupt government by bending the rules to their advantage.

5.0 Summary, Conclusion and Recommendations

According to the study's data analysis, the primary variables affecting bank financial performance in the African continent include corruption, inflation, FDI, and GDP. In the second model, FDI was important, but not in the first model. The inconsistency in the result may be influenced by other factors not covered in this study. However, corruption, GDP, and Inflation gave consistent results in the models. The consistency of the findings underscores the importance of those variables in determining the performance of banks.

The study infers further that the greasing-the-wheel hypothesis does not influence bank performance positively in Africa. Thus, this study recommended that a real-time fraud and corrupt detection mechanism be put in place by the bank management and government in the selected countries for prompt corruption detection and prevention. There should be appropriate punishments for anyone, or institutions found to have been engaged in corrupt practices to

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Chief Executive Officer (CEO) Characteristics, Board Structure and Dividend Payout of Listed Consumer and Industrial Goods Firms in Nigeria



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Abstract

In this study, we examined the influence of CEO Characteristics and board structure on dividend payout of quoted consumer and industrial firms in the Nigeria Exchange Group (NGX) from 2014 to 2021. Panel data of thirty-three (33) financial firms were sourced from the NGX annual publications and we adopted the fully modified ordinary least square technique in the analysis. The findings revealed that Long-term dividend payout in Nigeria are not

significantly impacted by a CEO's share ownership, education, or tenure. Board diversity exerts a significant direct influence on dividend payout in the long run during the period under review. Board independence negatively influences dividend payout in the Nigeria consumer and industrial sector though not significant. Finally, Board size is positive and significantly influences dividend payout in the long run in the consumer and industrial sector of Nigeria. The interplay of board independence and size with CEO tenure and education demonstrated a significant impact on dividend payment throughout the study period.

JEL Classification: L2, L22, C33.

Keywords: CEO Characteristics, Board Structure, Dividend Payout, Modified Ordinary Least Square.

1. Introduction

In modern times, managers are faced with critical decision making such as the management of firms' investment portfolios, development of new product and re-inventing existing ones as well as making financing decisions. Increasing firm's value has become a major responsibility of financial managers. As such, a notable and important decision facing managers is that which relates to the payment of dividend. Although companies prefer to keep profits for the purpose of investment, shareholders always desire a steady stream of cash flow with respect to their portfolio of investments. Therefore, companies need to deliberately resolve the volume of profits to be given to shareholders as dividends (Afza and Mirza, 2011). The decision as to whether or not to pay dividend is referred to as dividend policy.

A company's dividend policy establishes the rules for how and when dividend payments to shareholders will be made. The word "policy" is used to underline the need for consistency and predictability in payout pattern and magnitude rather than randomness or arbitrary decision-making (Kazmierska-Józwak, 2015).

Issues on dividend policy have become a cause of debate among students and researchers over the last five decades. According to Black (1976), the more closely we examine the dividend picture, the more it resembles a puzzle with pieces that are simply impossible to put together. The question of how much dividends company should pay out remains an

unresolved and puzzling question in finance. The issue of dividend policy has enjoyed a lot of controversial debates as a result of its perceived impact on financing and investment decisions of companies.

However it has come to light that several factors including CEO (chief executive officer) characteristics and board structure are germane in the determination of dividend payout decisions. Bandiera et al. (2020) asserts that CEO characteristics influences firm's dividend payout decisions. For example, CEO who has large share ownership in the firm will prefer to pay higher dividend, while overconfident CEO's will prefer to use internal source of finance (retention) hence, lower dividend payment (Malmender et al. 2007). Other CEO characteristics that have been found to influence dividend payment are CEO gender (Chen and Goergen, 2017), CEO tenure (Caliskan and Doukas, 2015) and CEO risk appetite (Deshmukh et al. 2009). The study of Nharo et al. (2021) have specifically linked board size and board independence to dividend payout and have found that more independent boards pay lesser dividend since the board are better able to monitor managers, hence lesser use of dividend payment. Ji (2017) asserts that the financial expertise of the board will lead to lower dividend payment. This is because following the substitution hypothesis, boards with more financial expertise will pay lower dividends as a result of the opportunity cost associated with dividend payments.

According to Sternberg (2004), the channel through which firms are controlled is through the use of board powers. Nigeria's committee on public company corporate governance recommended that the board must be adequately constituted to ensure diversity of experience and must be a mix of executive and non-executive directors. The Nigerian business space raises the question of whether there is good board structure in Nigerian Public Company. The recent happenings in the Nigeria business space beg the question as to if companies board follows or obey the corporate governance laws guiding them in Nigeria. Therefore, CEO (Chief Executive Officer) characteristics and board structure are major determinants of investors' confidence and invariably the maximization of shareholders wealth.

Nigeria is home to a substantial consumer market for both domestic and foreign businesses. Nigeria's retail, manufacturing, and consumer goods sectors will all experience significant development as the nation's rapidly expanding middle class expands. The food and beverage industry which makes up 65 percent of local manufacturing in Nigeria and contributes 8.7 percent of the country's GDP is the key driver of local manufacturing (Saidu, 2019). Many multinational corporations are utilizing the burgeoning consumer class as an opportunity to provide consumer-packaged goods to fulfill their needs. One must include Nigeria's expanding consumer class when evaluating the demand for industrial goods because this demand is a "derived demand" and is therefore driven by the demand for consumer goods. Against this backdrop, this study investigates the influence of CEOs characteristics and board structure on dividend payout of listed firms in the consumer and industrial goods sector in Nigeria.

2.0 Literature Review/Theoretical Framework Conceptual Review Concept of Dividend Policy

The payment of a company's profits to shareholders is referred to as "dividend". Das (2020) defines dividend policy as an organizational financial choice that determines how, when, and how much of the company's profit will be allocated as dividends. The same principles apply to dividend policy when deciding how much to reinvest and how much to distribute as dividends (Ebire et al. 2018). According to Chauhan et al. (2019), shareholders are paid dividend because of the risk they have assumed and the amount of dividend paid to each shareholder is a function of risk assumed. This is to say that firms known to pay low dividends would attract lesser investors since dividend payment is not at par with assumed risk. Maximizing shareholder wealth is the primary goal of dividend policy. The dividend policy a company chooses to follow affects the value of the firm. Since dividend payment has information content as to firm's earnings, payments or nonpayment of dividend is expected to influence firm's value and shareholders wealth.

CEO Characteristics

In the past few years, researches on CEO characteristics have surged probably because of its perceived impact on firm's value and performance. Evaluating the psychological and background

characteristics of the CEO has become imperative considering that certain decisions can be made based on psychological disposition and cultural background. This paper will dichotomize CEO characteristics to include CEO share ownership (dominance), CEO tenure and CEO education and provide a theoretical link between the CEO's identified characteristics and dividends pay.

CEO Share ownership and Dividend Payout

In the corporate environment, a lot of firms are operated by managers of which the most significant is the Chief Executive Officer (Awasmehen, 2021). As claimed by the agency theory put forward by Jensen and Meckling (1976), managers are opportunistic in behavior and will engage in activities that may jeopardize owner's interest. Therefore, conflict arises between owners and managers which are known as agency conflicts. To reduce the conflicts, the firms are expected to pay out dividend or managers are expected to hold an amount of company stocks therefore making them managers and owners simultaneously (Al-Qahtani and Ajina, 2017). A situation where managers hold shares in an organization is known as managerial ownership (Lumapow, 2018). Since the CEO is a high ranking member of management, the term managerial share ownership will be used interchangeably to refer to CEO share ownership in this study.

CEO Education and Dividend Payout

Managerial ability and human capital has been regarded as intangible assets of a firm (Andreou, 2013). Managerial ability is built or developed through a former education and in some rare cases informal education and experience. Since the CEO is at the aim of affair of managerial activities, the ability of the CEO becomes paramount which are often at times gauged by his/her educational qualifications. Fujianti (2018) defines a school career as a record of educational background obtained by an individual. Kusumastuti et al. (2007) asserts that university education helps an individual career and makes the individual stand out among his contemporaries. This thus implies that CEO's with higher education are better able to process and analyze information to improve existing products and develop new ones.

CEO Tenure and Dividend Payout

CEO tenure refers to the span or period of an individual occupying the office of CEO (Modu et al.

2020). CEO tenure has often been used in empirical studies to proxy managerial entrenchment (Modu et al. 2020). Management entrenched is defined as probabilities for managers to choose to concentrate power (Hu and Kumar, 2004). Galiakhmetova et al. (2016) conclude that when CEO with fear of discipline exists (CEO with more tenure), shareholders tend to be paid higher dividends. This follows the entrenchment hypothesis that suggests that CEO's will pay higher dividend to avoid a takeover.

Board Structure

The board of directors is saddled with the responsibility of approving strategic goals, making plans, setting general policies and guiding corporate affairs. Therefore, given the role of the board of directors (BOD), their characteristics are expected to influence corporate decisions like capital structure, dividend policy and investment decisions. This study considers some board Structure and their perceived impact on dividend policy. The study takes into account board size, board diversity, and board independence.

Board Size and Dividend Payout

Board size, according to Borokhovich et al. (2005), refers to the total number of board members for an organization. While no particular number has been specified as standard size, Jo and Pan (2019) recommend a little board size involving between seven to ten chiefs. Jensen (1993) likewise specified that the base number of board individuals should not to be under eight. As indicated by the 2012 UK joined code, the quantity of board of directors ought to be adequate to such an extent that the business can be led with no huge challenge.

Board Independence and Dividend Payout

According to Clifford and Evans (1997), board independence is the ratio of non-executive to executive directors. A board with larger number of non-executive directors to executive directors can be assumed to be autonomous. Shafana and MGH (2019) states that non-executive directors are corporate instrument to adjust the interest among investors and administrators.

Board Gender Diversity and Dividend Payout

Board orientation diversity is utilized to allude to the heterogeneous qualities of board individuals as it

connects with orientation, age, identity, training, nationality, etc. A well assorted board is supposed to improve navigation and upgrade the firm's operations (Iren, 2016). Setiawan and Aslam (2018) noted that gender diversity is necessary because of rich human resources that may be present in the board (Chen et al. 2014). Eckel and Fullbrunn (2015) attest that females are warier and moderate than the guys. Accordingly their choices are less extreme and less certain. Faccio et al. (2016) archived that female CEO's in the board use lower debt obligation since they are more gamble unfriendly and moderate in nature.

Empirical Literature

Saidu (2019) researched the effect of CEO's possession, instruction and beginning on firm's execution. Information crossing 2011-2016 was dissected utilizing the conventional least square technique. Discoveries showed that CEO instruction further developed productivity. Essentially, stock buying and selling got further developed because the CEO had related knowledge of the firm prior to being designated as the CEO. Altuwaijiri and Kalyanaraman (2020) broke down the relationship between CEO schooling and board exhibition of firms recorded in Saudi Stock Exchange for the period 2018. It was discovered that graduate CEOs improve execution while moving on from a homegrown organization impacts execution emphatically. The executive's level of CEO did not appear to affect execution.

Modu et al. (2020) explored the impact of CEO residency, ethnicity, and orientation and offer proprietorship on profit strategy in three (3) Sub Sahara African (SSA) nations (Nigeria, South Africa and Kenya). Information spreading over 2012-2016 were utilized for examination and the Kruskal-Wallis was utilized to test the theory. Discoveries showed that CEO ethnicity and proprietorship had a huge relationship with dividend payout during the time of study. The association between dividend payout and corporate traits of listed companies on the Nairobi Stock Exchange was investigated by Murekefu and Ouma (2020). The investigation was conducted to establish the link between the payment of profits and the performance of the business. The discovery demonstrated that the payment of profits is a key consideration affecting business operations. The relationship was also significant and positive.

Edi et al. (2020) checked the influence of the position and qualities of the CEO on the business after securing the business and consolidating it for the period spanning 2010-2016. OLS strategy was used for the review and findings indicated that the selection of a competent and dynamic CEO can enhance the company's status and execute the company. The findings have also shown that a Knowledgeable and experienced executives ready to intervene as assets to grow the business. Alhmood et al. (2020) examined the impact of CEO personal traits on real earnings management (REM) practices in Jordan from 2013 to 2018. To accomplish the goals of this study, data regarding 58 firms that were listed on the Amman Stock Exchange were utilized.

The findings of this study suggest that CEO experience and REM are related. The REM between Jordanian firms is not impacted in the meantime by the CEO's residence. Additionally, the findings demonstrate that CEO dualism and REM have a negative underlying relationship. Finally, it was discovered that the CEO's political affiliation had a particular, fundamental connection to REM. In Saudi Arabia, Ghardallou et al. (2020) studied the effect of attributes (CEOs) on presentation of companies, during the period 2014 to 2017. The GMM was utilized to examine the relationship and discoveries showed that CEO instructive foundation matters. Specifically, organizations utilizing CEOs with business organization, financial matters, money, or bookkeeping will do better exceptionally. Furthermore, the performance of actions is further developed if the CEO has graduate qualifications like a Ph.D, MBA or an M.Sc. In addition, the results show that leaders who have gotten involved in a related field will definitely affect the board's exposure in the long term. Finally, the evidence suggests that the high education of CEOs affects corporate governance. In the interim, CEO's education affected REM among Jordanian firms.

Bhutta et al. (2021) analyzed the impact of administrative capacity (Education) on firm's execution utilizing an example of 246 firms documented at the Pakistan Stock market. The assessment time frame spread over 2009-2017 while the two stages least square (2SLS) was utilized for the exact investigation. Discoveries showed that more capable supervisors who achieve some

instructive capability essentially increment the firm presentation while less capable chiefs altogether diminish the firm exhibition for both bookkeeping and market proportions of firm execution. Urguhart and Zhang (2021) inspected the connection between CEO instruction and board's monetary exhibition in the U.S for the period 1999-2017. Variable examination, expressive insights and various methodologies were utilized to dissect the dataset. The findings show that CEOs with an M.Sc expand business productivity by 3.03%, while CEOs with PhDs increase from an exceptionally positioned college increase firm execution by 4.65%. Further experimental examinations showed that the expansion in firm execution is because of a tighter control of expenses and prevalent income from the board.

Rehman et al. (2021) explored the connection between CEO attributes and firm's monetary execution in Pakistan for the period 2010-2019. The review utilized least square to break down the information and discoveries showed that CEO education and duality are negatively connected to board's exhibition in Pakistan. Discoveries additionally showed that female CEO and non-public CEO has a negative relationship with firm execution.

Theoretical Framework

The Bird-in-Hand Hypothesis

Gordon (1959) and Lintner (1959) first advanced this hypothesis. This speculation assumes that profit choices impacts board's worth. As indicated by the speculation, what's to come is unsure; profits are esteemed more than held income (capital addition). In theory, contributors are seen as opponents of opportunity and as such will generally prefer 'bird in hand' (profit case) as opposed to 'two shrubs' (capital addition). Next with this relationship, the value of the company is expected to increase with the increase in profit payout. Earning high returns is believed to reduce future vulnerability to earnings. This will in turn cause a reduction in the cost of acquiring capital and hence an increase in firm value. Modigliani and Miller (1961) reviewed the BIHH and argued that the board still exists by the risk of its earnings from the job, not by the way it rotates its profits. M&M therefore calls this description a twist of a bird in hand. Furthermore, Bhattacharya (1979) recommends that the idea of hiding BIHH is inaccurate. In addition, It is recommended that the company's bet affects the level

of profitability and not vice versa. That means an association's earnings risk affects its benefit payout, however increased profits will not reduce the company's bets. The idea that organizations facing future income vulnerability (risk) will generally take lower payout ratio is clearly hypothetically conceivable (Friends and Pouket, 1964). Precisely, Rozeff (1982) found an adverse link among profitability and safe betting. So that as the gambling of club activities stack up, the profit installments decline (Jensen, Solberg and Zorn, 1992).

3.0 Methodology Research Design, Population, Sample, Scope and Source of Data

The causal research design was adopted which is a type of ex post factor research design. This design is therefore chosen as it especially suits our study as it intends to examine the relationship between variables. The census sampling method was adopted in this study were population equals sample. Currently, 20 firms are listed in the consumer goods sector while 13 firms are listed in the industrial goods sector (Nigeria Exchange Group, 2021). This brings our total sample size to thirty three (33) firms. Firm specific data relating to the variables were gotten from the Nigeria Exchange Group annual publication of the sampled firms spanning 2014-2021. We utilized The Fully Modified Ordinary Least Square (FMOLS) technique for estimation and analysis. To capture relationships between study variables, this study employed the model of Modu et al. (2020) whose study modeled dividend payout to be a function of CEO characteristics.

Preliminary Test and Estimation Procedure

Analysis of the study begins with a preliminary analysis of descriptive statistics so as to identify the individual properties of the variables considered. These tests showed both the individual characteristics of the variables to be employed. The mean, median, kurtosis, skewness and other relevant properties of the variables were examined. Again, the existing relationship between variables was explored using correlation matrix. We also employed Levin, Lin & Chu's test (LLC), Im, Pesaran & shin (IPS) panel unit root tests to test for stationarity. The LLC tests are established on the assumption of a common unit root process while the IPS is based on the assumption of individual entity root processes. Finally, this study utilized the Fully Modified Ordinary Least Square

(FMOLS) technique for estimation and analysis. This is useful in determining the impact of CEO characteristics, board structure on dividend payout of listed firms in the consumer and industrial goods sector in Nigeria.

Model Specification

To capture relationships between study variables, this study employs the model of Modu et al. (2020) whose study modeled dividend payout to be a function of CEO characteristics and Dissanayake and Dissabandara (2021) whose study modeled dividend payout to be a function of board structure. Specifically, their models are given respectively as;

$$DPO = f(CEOT, CEON, CEOG, CEOS) \tag{1}$$

$$DPO = f(ACS, WOB, BI, BS, BM, CD) \tag{2}$$

Where;

CEOT = CEO tenure

CEON = CEO nationality

CEOG = CEO gender

CEOS = CEO share ownership

DPO = Dividend payout

ACS = Audit committee size

WOB = Women on board

BI = board independence

BS = Board size

BM = Board meeting

CD = CEO duality

Adapting equation (1) and (2) This study model dividend payout as a function of CEO characteristics and board structure. We thus obtain the following equation;

$$DPO = f(CEOS, CEOE, CEOT, BI, BS, BD) \tag{3}$$

Equation (3) cannot be empirically estimated, hence we re-specify an econometric model and we obtain equation 4

$$DPO_{it} = \beta_0 + \beta_1 CEOS_{it} + \beta_2 CEOE_{it} + \beta_3 CEOT_{it} + \beta_4 BI_{it} + \beta_5 BS_{it} + \beta_6 BD_{it} + \epsilon_{it} \tag{4}$$

Where;

DPO = Dividend payout (Earnings /Dividend per share)

CEOS = CEO shareholding (Percentage number of CEO shares to total shares held by other members).

CEOE = CEO education (Dummy variable were the value '1' is given if the CEO has an educational certificate otherwise the value '0' is given).

CEOT = CEO tenure (Length of time between when the CEO joined the company and the current year).

BI = Board independence (Percentage of executive to nonexecutive directors in the firm).

BS = Board size (Total number of board members).

BD = Board diversity (Total number of directors who are females as a percentage of the total members of the board).

$\beta_0 = \text{Intercept}$

$\beta_1 - \beta_6 = \text{Betacoefficients}$

$\epsilon_{it} = \text{error term}$.

Equation (4) is modified to variables of CEO characteristics plus interaction with each indicator of board structure. The coefficient of the interaction term estimates the differences in the effects of CEO characteristics on dividend payout given the independence, size and diversity of the board.

$$DPO_{it} = \beta_0 + \beta_1 CEOS_{it} + \beta_2 CEOE_{it} + \beta_3 CEOT_{it} + \beta_4 (CEOS_{it} * BI_{it}) + \beta_5 ((CEOE_{it} * BI_{it})) + \beta_6 ((CEOT_{it} * BI_{it})) + \epsilon_{it} \tag{5a}$$

$$DPO_{it} = \beta_0 + \beta_1 CEOS_{it} + \beta_2 CEOE_{it} + \beta_3 CEOT_{it} + \beta_4 (CEOS_{it} * BS_{it}) + \beta_5 ((CEOE_{it} * BS_{it})) + \beta_6 ((CEOT_{it} * BS_{it})) + \epsilon_{it} \tag{5b}$$

$$DPO_{it} = \beta_0 + \beta_1 CEOS_{it} + \beta_2 CEOE_{it} + \beta_3 CEOT_{it} + \beta_4 (CEOS_{it} * BD_{it}) + \beta_5 ((CEOE_{it} * BD_{it})) + \beta_6 ((CEOT_{it} * BD_{it})) + \epsilon_{it} \tag{5c}$$

Apriori Expectations

From literature, an increase in CEO share ownership is expected to lead to an increase in dividend payout as elucidated in the work of Fujianti et al. (2020) while better CEO education is expected to have a significant impact on dividend payout and it can be positive or negative (Gottesman and Morey, 2010). CEO tenure is anticipated to be positive or negative (Al-Ghazali, 2014; Jo and Pan, 2019). Board size is expected to be positively related to dividend payout, (Kiel and Nicholson, 2003). Board independence and Board diversity are also expected to have a positive or negative relationship with dividend payout (Abor and Fiador, 2013; Shehu, 2015). Mathematically, the expected relationship is shown as; $\beta_1, \beta_5 > 0, \beta_2, \beta_3, \beta_4, \beta_6 < 0 >$

4.0 Analysis of Results and Discussion of Findings

Table I. Descriptive Statistics

The coefficient of variation among majority of the variables (except for DPO and CEOS) are very slim as

	Mean	Median	Max	Min	Std. Dev.	Skewness	Kurtosis	J-Bera Stat	Prob
BD	1.480469	1	6	0	1.292364	0.736709	3.341459	24.40056	0.00
BI	0.649283	0.666667	1.125	0.25	0.118276	-0.0986	3.519646	3.295129	0.19
BS	9.628906	9	19	4	3.280212	0.542684	2.71702	13.41974	0.00
CEOE	10.13672	13	13	1	4.249205	-1.04016	2.32683	50.99585	0.00
CEOS	0.108901	0.032897	0.52	0.000128	0.13372	1.061616	3.455302	50.29778	0.00
CEOT	5.667969	5	17	1	3.824984	0.67395	2.608505	21.01444	0.00
DPO	0.929866	0.146749	16.120	0	2.195655	4.763063	29.69703	8570.44	0.00

Source: Authors Computation Using E-views 9.0 (2023)

indicated by the ratio of mean to median that is approximately one. There is a reasonable variation between the maximum and minimum values of the variables during the period under consideration. The most risky variables faced by the firms during the period are CEOE, followed by CEOT and BS as indicated by their corresponding standard deviations values. The J-Bera statistics that put Kurtosis and Skewness into consideration in computing it shows that only BI is normally distributed as indicated by its probability value that is not significant at 5% level of significance. The converse holds for other variables.

Table II: Correlation Matrix

Correlation							
t-Statistic							
Probability	BD	BI	BS	CEOE	CEOS	CEOT	DPO
BD	1.000000						

BI	0.246984	1.000000					
	4.062128	-----					
	0.0001	-----					
BS	0.382649	0.116407	1.000000				
	6.600777	1.867913	-----				
	0.0000	0.0629	-----				
CEOE	-0.134122	0.029665	0.111412	1.000000			
	-2.157046	0.472994	1.786741	-----			
	0.0319	0.6366	0.0752	-----			
CEOS	-0.198712	-0.080157	-0.253454	0.031849	1.000000		
	-3.231390	-1.281617	-4.175740	0.507843	-----		
	0.0014	0.2011	0.0000	0.6120	-----		
CEOT	-0.222255	-0.129789	-0.261467	-0.099499	0.113013	1.000000	
	-3.633030	-2.086138	-4.317283	-1.593662	1.812749	-----	
	0.0003	0.0380	0.0000	0.1123	0.0711	-----	
DPO	0.092516	0.203123	0.366261	0.095460	-0.130256	-0.046983	1.000000
	[1.480810]	[3.306163]	[6.273138]	[1.528357]	[2.093781]	[0.749619]	-----
	[0.1399]	[0.0011]*	[0.0000]*	[0.1277]	[0.0373]**	[0.4542]	-----

t-statistics are in [] while Probability values are in () * & ** = Significant at 1% Level
Source: Authors Computation Using E-views 9.0 (2023)

The direction and the magnitude of relationship between the variables of interest are shown in table II. BD, BI BS and CEOE (0.092516, 0.203123, 0.366261, and 0.095460) have weak and positive association with DPO. However, only the relationship between DPO, BS and CEO are not significant as indicated by their corresponding probability value appeared as non-significant at 5% level of confidence. This shows that an increase in BI and BS significantly increases DPO during the period examined. On the contrary, CEOS and CEOT have a very weak and inverse association with DPO as revealed by the correlation coefficient (r) of 0.13 and

0.04 respectively. Only the association of CEOS (0.0373) and DPO is significant at 5% level of confidence. This means that an increase in CEOS decreases DPO significantly during the studied period. The correlation matrix further revealed the absence of multi-collinearity among variables since there is no correlation coefficient among the variables that is up to 0.80.

Table III: Stationarity Test

Im, Pesaran and Shin W-stat (IPSW) Test						
Variables	@ Levels			@ First Difference		
	IPSW Stat	Order	Comment	IPSW Stat	Order	Comment
DPO	-0.50451	I(0)	NS	-9.54009*	I(1)	S
CEOT	-9.9E+13*	I(0)	S	-3.6E+14**		---
CEOS	1.62068	I(0)	NS	-5.48153*	---	---
CEOE	0.61674	I(0)	---	-6.2E+13*	---	---
BS	-0.86318	I(0)	---	-4.6E+13*	---	---
BI	0.60505	I(0)	NS	-8.77295	---	---
BD	0.51730	I(0)	NS	-4.32114	---	---
Critical Values						
1%	-4.67600	I(0)		-4.62120	I(1)	
5%	-3.41640	---		-3.38112	---	
10%	-3.02600	---		-3.02048	---	

S = Stationary, NS = Not Stationary

* & ** = 1% and 5% Level of Significance

Source: Authors Computation using E-views 9.0 (2023)

To avoid a spurious regression output, the stationarity status of the variables must be ascertained due to the time series attribute that is inherent in panel data. The Im, Pesaran and Shin W-stat Test is employed and the result is shown in table III. At levels, only CEOT was stationary. The same level of integration is a necessary condition to be met in Fully Modified OLS (FMOLS) technique. Thus, we took the first difference of all variables. All variables became stationary at first difference (right hand side of table III) and integrated of order one I(1) since their corresponding calculated value is higher than their critical values at 5% level of confidence.

Table IV: Co-integration Test

Kao Test			
Variable	T- Statistics	Prob.	Remark
ADF	17.13320*	0.0000	Co-integrated

* & ** = 1% and 5% Level of Significance

Source: Authors Computation using E-views 9.0 (2023)

The Kao co-integration was used to establish relationship among all variables of interest on a long-run basis. The t-stat value of 17.13 is significant at 5% confidence level. This implies that co-integrating relationship exist between variables. That is, any variable that deviate after short run shock will adjust to equilibrium in the long-run.

Table V: Fully Modified Ordinary Least Square (FM-OLS) Result

Variables	Model 4	Model 5a	Model 5b	Model 5c
	Coefficient	Coefficient	Coefficient	Coefficient
CEOS	-4.156189 [-0.401827] (0.6897)	5.426337 [0.132358] (0.8956)	1.837584** [2.453727] (0.0001)	5.685148 [0.264147] (0.7924)
CEOE	-0.268582 [-1.321719] (0.1928)	-0.271374 [-0.420256] (0.6774)	-0.097124 [-0.425708] (0.6716)	-0.404404** [-2.378293] (0.0200)
CEOT	-0.028511 [-0.189575] (0.8505)	-0.408198 [-0.414148] (0.6818)	0.789096** [2.013400] (0.0393)	0.064938 [0.206446] (0.8370)
BD	1.029628* [2.356931] (0.0227)			
BI	-0.837505 [-0.298321] (0.7668)			
BS	0.525848** [2.394077] (0.0400)			
CEOS*BD		0.341630 [0.014353] (0.9886)		
CEOE*BD		0.118775 [0.438543] (0.6642)		
CEOT*BD		0.164132 [0.311079] (0.7580)		
CEOS*BI			-17.87642 [-0.600739] (0.5498)	
CEOE*BI			0.705276** [2.465751] (0.0428)	
CEOT*BI			-1.757475** [-3.285202] (0.0304)	
CEOS*BS				-0.924948 [-0.426523] (0.6710)
CEOE*BS				0.038190** [2.708121] (0.0084)
CEOT*BS				-0.012194 [-0.429385] (0.6689)
R-squared	0.916798	0.609194	0.860982	0.889804
Adjusted R²	0.849874	0.532113	0.791473	0.834706

Dependent Variable = DPO

* & ** = 1% and 5% Level of Significance

Source: Authors Computation using E-views 9.0 (2023)

The FMOLS model that contains firm CEO characteristics and board structure variables in table V shows the cause-effect nexus between the dependent and the independent variables. The coefficient of determination of 0.85 approximately in model 4 shows that the entire variables jointly explained 85% of total systematic changes in DPO after adjusted for degree of freedom without interaction between board structure variables and CEO characteristic variables. Upon interaction among explanatory variables the model could still explain a minimum of 53% and maximum of 84% of total variation in DPO after adjusting for degree of freedom as indicated by their corresponding adjusted R² values of 0.53, 0.79 and 0.84 respectively in model 5a to 5c. Only 16% of total changes in DPO were not captured in the model due to other factors that influence DPO that was not included in the model, but captured by the random error term. Thus, the model has goodness of fit in the line of regression.

In model 4, only BD and BS passed the test of significance at 5% level of confidence. This is shown by their values of probabilities that are less than 0.05. Similarly, in model 5b only CEOS, CEOT, CEOE*BI and CEOT*BI pass their significant test at 5% confidence level as exhibited by their corresponding probability values that are < 0.05. CEOE and CEOE*BS pass the significant test at 5% confidence level in model 5c. These variables contributed more to the various model in different magnitude during the studied period. None of the variables contributed significantly to DPO in model 5b at 5% confidence level. The post regression test is needed to determine the absence of serial correlation in the model in order to authenticate the result.

Post Regression Test

Table VI. Q-Statistics Higher Order Serial

Model 4						
Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob*	
. **	. **	1	0.278	0.278	8.8928	0.300
. .	. .	2	0.030	0.051	8.9978	0.110
** .	** .	3	0.231	0.245	15.222	0.220
** .	* .	4	0.246	0.132	22.363	0.300
** .	* .	5	0.209	0.117	27.562	0.120
Model 5a						
Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob*	
. **	. **	1	0.620	0.620	14.655	0.520
. .	. .	2	0.392	0.011	20.678	0.310
** .	** .	3	0.106	0.230	21.129	0.150
** .	* .	4	0.029	0.019	21.165	0.110
** .	* .	5	0.060	0.067	21.319	0.181
Model 5b						
Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob*	
. **	. **	1	0.505	0.505	29.277	0.230
. .	. .	2	0.140	0.154	31.546	0.150
** .	** .	3	0.217	0.303	37.052	0.210
** .	* .	4	0.383	0.178	54.412	0.370
** .	* .	5	0.328	0.030	67.265	0.310
Model 5c						
Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob*	
. **	. **	1	0.377	0.377	16.384	0.140
. .	. .	2	0.076	-	17.061	0.180
** .	** .	3	0.222	0.262	22.816	0.240
** .	* .	4	0.263	0.101	30.965	0.160
** .	* .	5	0.298	0.179	41.531	0.260

AC = Autocorrelation, PAC = Partial Autocorrelation

Source: Authors Computation using E-views 9.0 (2023)

Correlation

The Q-statistics result of model 4 to 5c is presented in table VI. In the various models the Q-statistics values up to order five (5) in the entire models are highly insignificant at 5% confidence level. This implies that there is no serial correlation in the specified model. Thus, the models are reliable for policy implications and recommendation without misrepresentation and misleading of facts.

Discussion of Findings

The explanatory variables conform to a *a priori* expectation except for CEOE and BD that behaves contrary to this assertion. The contrary behaviour of these variables (CEOE and BD) could be attributed to policy shock in the sector and Covid-19 pandemic shock observed during the studied period. All the variables have different degree of influence on dividend payout as shown by the corresponding values of coefficients in table IV. First, Board structure and personal characteristics of CEOs, CEOE and CEOT have a non-significant negative influence on dividend payout (DPO). A unit increase in these variables will result to 4.1561, 0.2686 and 0.0285 insignificant unit decrease in DPO of quoted firms in the Nigeria consumer and industrial sector. These findings are in line with that of Nguyen, Dang and DAU (2020) in the literature who reported that CEO attribute have a negative influence on dividend payout. However, the finding is contrary to that of Modu *et al.* (2020) and Altuwaijiri and Kalyanaraman (2020) who found that CEO share ownership and CEO education had a significant relationship with dividend payout during the studied period.

Board Diversity (BD) is positive and significantly influences DPO. This means that a unit increase in BD will lead to 1.0296 unit significant increase in DPO and vice-visa. This finding corroborates that of Shafana and MGH (2019), Naburi and Ndede (2019) in the literature. They reported that board independence significantly influence dividend payout. Similarly, Board Size (BS) has a significant positive impact on DPO during the studied period. This indicates that a unit increase in BS will lead to 0.5259 unit increase in DPO. Thus, larger BS is beneficial to increase DPO in the Nigeria consumer and industrial sector. This is in tandem with the research outcome of Tahir *et al.* (2020) and Uwuigbe *et al.* (2015) in the literature. They reported a positive

and significant relationship between size of the board and payout of dividend. We also observed that the independence of the board, BI has a negative and non-significant influence on payout of dividend in the Nigeria consumer and industrial sector in Nigeria. This is contrary to the finding of Kurawa and Ishaku (2014) who reported that board independence is significantly related to payout of dividends among selected companies in Nigeria.

Additional information on how the explanatory variables influence DPO was revealed by this study when governance structure and personal attribute variables were interacted as shown in model 5a to 5c respectively. First, in model 5a, the effect of CEOs, CEOE and CEOT on DPO remain insignificant at 5% confidence level. However, using these attributes to consider the level of board diversity (BD) of the firms in the sector. Their effect on DPO becomes positive but remains insignificant. This also, buttress corporate governance policy inefficiency in this direction; as the desired objective of this policy has not been achieved. However, the coefficient of CEOs and CEOT were significant at 5% confidence level in model 5b. This implies that a unit increase in these variables significantly increases dividend payout by 1.8376 and 0.7891 units respectively. Modu *et al.* (2020) reported similar finding in their study. CEOE*BI and CEOT*BI have mixed significant influence on DPO. The impact of the former is positive while that of the later is negative. This implies that considering the level of board independence in the consumer and industrial sector CEOE will positively and significantly influence dividend payout by 0.7053units. Saidu (2019) reported similar findings; while CEOT will negatively and significantly reduce dividend payout by 1.7575 units.

Finally, considering the interaction between governance structure, personal attribute and board size in model 5c, only CEOE has significant inverse effect on DPO. The proportion of board size (BS) available helps to moderate the effect of CEOE to become positive and significant at 5% confidence level as indicated by the CEOE*BS coefficient. This implies that a unit increase in CEOE and BS will significantly spur DPO by 4% (0.04). Saidu (2019) reported the same finding in his study that CEO education significantly spurs dividend payout. This also shows that the corporate governance policy in this sector is in the right direction and it is achieving

the desired objective of maximizing shareholder's wealth. It can be inferred from the study's result that the influence of CEO share ownership, education and tenure is a function of board structure that is on ground. The result follows the argument of Ozili (2021) and Ullah *et al.* (2021) that the relationship between governance structure, personal attributes and firm's outcomes can be non-linear.

5.0 Summary of Findings

The findings of this study are hereby summarized:

1. Chief Executive Officers share ownership is negative and does not significantly impact dividend payout in the consumer and industrial sector in Nigeria.
2. Chief Executive Officers education is negative and does not significantly impact dividend payout in the consumer and industrial sector in Nigeria.
3. Chief Executive Officers tenure is negative and does not significantly impact dividend payout in the consumer and industrial sector in Nigeria.
4. Board diversity exerts a significant positive influence on dividend payout the consumer and industrial sector in Nigeria.
5. Board independence is negative and does not significantly influence payout of dividend in the Nigeria consumer and industrial sector.
6. Board size exact a significant positive influence on dividend payout in the consumer and industrial sector of Nigeria.

6.0 Conclusion and Recommendations

In this study, we investigated the influence of CEO characteristics and board structure on dividend payout of listed firms in the consumer and industrial sector in the Nigeria Exchange Group (NGX) from 2014 to 2021. Panel data of thirty-three (33) financial firms were sourced from the NGX annual publications. The fully modified ordinary least square regression approach methodology was adopted. The findings show that firstly; Long-term dividend payout in Nigeria is not significantly impacted by a CEO's share ownership, education, or tenure. However, with relation to board independence and board size, board size, CEO share ownership, and longevity all have a major impact on dividend payout. The interplay of board independence and size with CEO

tenure and education demonstrated a significant impact on dividend distribution throughout the course of the study period. Second, Board diversity exacts a significant direct influence on dividend payout in the long run during the period under review. Third, Board independence is negative and does not significantly influence payout of dividend in the Nigeria consumer and industrial sector. Finally, Board size is positive and significantly influence dividend payout in the long run in the consumer and industrial sector of Nigeria.

From the foregoing analysis, this study concludes that CEO attributes of share ownership, education and tenure and Board structure variables of Board independence, size and independence are non-linear significant determinants of dividend payout in the long run in Nigeria. However, the effect of CEO attributes variables largely depends on the degree of board structure that is available in the consumer and industrial sector. The outcome of this study gave the impetus for the following recommendations:

1. Consumer and industrial firms listed in Nigeria should rely on their board diversity and size as a veritable tool to maximize shareholders wealth and grow their dividend payout capability.
2. Effective and efficient policy that will balance the proportion of CEO attributes to that of board characteristics should be implemented in the sector; to foster significant CEO characteristics impact on dividend payout.
3. A well-organized corporate board attribute is strongly suggested in the consumer and industrial sector in Nigeria to affect positively on dividend pay-out policy.
4. In order to change the characteristics of CEOs, companies should be pushed to pay higher dividend, prevented from hiring CEOs based on family relationships and implement strong corporate governance practices in the consumer and industrial sector.
5. Listed companies in the consumer and industrial sectors should give high-caliber directors enough compensation to attract and retain them, plan annual increases in their pay to keep them motivated.
6. Manager's interests should connect with the creation and generation of value for all of the

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Assessment of Economic Implications of Environmental Degradation and Natural Resource Exploration in Nigeria



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Abstract

This study delves into the intricate relationship between environmental degradation and natural resource exploration in Nigeria, with a specific focus on its economic implications. While economic growth initially exacerbates environmental degradation, there are indications of a potential path toward eventual improvement. The exploration of natural resources, particularly in the oil and gas sector, fuels Nigeria's economic growth but also brings challenges like resource depletion, social tensions, and environmental degradation. The study evaluates existing policies on environmental degradation and natural resource exploration to provide improved policy recommendations addressing current gaps. Employing a cross-sectional survey design, data were collected through an online survey. The data were visualized using pie charts and analyzed inferentially using Multinomial Logistic Regression to determine the impact of environmental quality and the abundance of natural resources on Nigeria's economic performance. The study reveals that these variables have significant impacts on Nigeria's economic performance, though degrading. Recommendations include enhancing and enforcing environmental regulations to curb environmental degradation, especially in industries like oil and gas, and promoting the widespread adoption of clean and sustainable technologies across all industries.

Keywords: *Environmental degradation, Natural resource exploration, Economic implications, Environmental regulations, Sustainable technologies.*

1.0 Introduction

The intricate relationship between environmental degradation and natural resource exploration in Nigeria significantly impacts the nation's socio-economic landscape, guiding its developmental trajectory (Wasiu et al., 2022). Nigeria, Africa's most populous nation and a global oil industry player, faces multifaceted challenges due to rapid industrialization, population growth, and climate change (Aminu et al., 2023).

This study delves into the complex interaction of environmental degradation and natural resource exploration in Nigeria, aiming to illuminate its profound economic implications. It provides a nuanced understanding of Nigeria's environmental challenges, their economic costs, and opportunities for sustainable development.

Environmental degradation, including deforestation and pollution, affects Nigeria's economic performance and key sectors like agriculture, healthcare, and manufacturing (Cordelia et al., 2022). Natural resource management, especially in the oil and gas sector, brings revenue but also presents challenges like resource depletion and social tensions (Anthony et al., 2023). Given climate change's global significance, the study explores its economic consequences in Nigeria, including mitigation and adaptation strategies for economic growth and well-being.

The study will contribute to knowledge by thoroughly investigating Nigeria's environmental degradation, natural resource exploration, and economic aspects, providing essential insights for evidence-based decisions. The study's comprehensive perspective will aid in crafting sustainable policies for Nigeria's unique challenges and opportunities.

In conclusion, this study will empower Nigeria to effectively address the complex challenges posed by environmental degradation and natural resource exploration, fostering economic resilience and sustainable development for the nation and its people.

1.1 Background of the Study

Environmental degradation and the exploration of natural resources are critical issues that have significant economic implications, especially in developing countries. Nigeria, as one of Africa's most populous nations and a major player in the global energy and mineral resource sectors, is no exception to these challenges. The environmental degradation in Nigeria, stemming from deforestation, pollution, and soil degradation, poses substantial threats to the country's ecosystems and human well-being

(Adewuyi et al., 2019). At the same time, Nigeria's vast reserves of natural resources, including oil, gas, and minerals, have fueled its economic growth over the years (Aigbedion & Iyayi, 2007; Olajire, 2015). However, the economic benefits derived from these resources are also associated with environmental trade-offs.

1.2 Statement of the Problem

Nigeria is endowed with an abundance of natural resources, but the country's heavy environmental and economic burdens have resulted from the resources' extensive exploration and exploitation. Local communities' possibilities for economic growth and well-being have been severely impacted by environmental degradation. Simultaneously, the depletion of these valuable resources has diminished the nation's revenue and hindered overall economic growth. Despite the growing awareness of these pressing issues, there remains a significant gap in comprehensive research dedicated to understanding the economic dimensions of environmental degradation and natural resource exploration within Nigeria. Hence, this study takes a deep dive into understanding the economic outcomes of both environmental degradation and natural resource exploration in Nigeria. It aims to bridging the current knowledge gap by offering crucial insights and practical policy solutions.

1.3 Aim and Objectives

The aim of this study is to assess the economic implications of environmental degradation and natural resource management in Nigeria, and also to recommend policies to address the challenges. These are the objectives of the study:

1. To assess the current economic impact of environmental degradation, natural resource depletion on Nigerian economy.
2. To examine the effectiveness of existing environmental and natural resource management policies in Nigeria and their contribution to sustainable development.
3. To determine the relationship between environmental quality, natural resource abundance and economic performance in Nigeria.

2.0 Literature Review

Environmental degradation and the exploration of natural resources in Nigeria have long been subjects of academic investigation. This literature review seeks to provide a comprehensive understanding of the topics by examining the conceptual, theoretical, and empirical frameworks that underpin them.

2.1 Conceptual Framework

2.1.1 Definition of Environmental

Degradation

Environmental degradation encompasses the progressive deterioration of the natural environment, encompassing elements like air quality, water resources, and soil health. This degradation stems from human activities such as industrialization, urban expansion, and the relentless pursuit of natural resources. In Nigeria, the issue of environmental degradation has escalated into a pressing concern due to its detrimental impacts on the well-being and livelihoods of local communities, as well as its far-reaching effects on the country's economy. Several factors have been identified as substantial contributors to the environmental decline observed in Nigeria, with population growth, energy consumption, trade openness, financial development, and foreign direct investment all playing pivotal roles (Ayobamiji & Adediran, 2020; Yahaya & Ibrahim, 2020; Eze & Eze, 2019).

Numerous studies have indicated that as the Nigerian economy expands, it tends to leave a positive mark on CO₂ emissions, suggesting a more substantial environmental footprint. Similarly, the utilization of energy resources and the influx of foreign direct investment have been associated with heightened environmental degradation (Ayobamiji & Adediran, 2020; Akinlo, 2022; Eze & Eze, 2019). Nonetheless, the connection between economic growth and environmental degradation is not as straightforward as it may appear. Some research even hints at the presence of an Environmental Kuznets Curve, proposing that while environmental degradation initially intensifies with economic growth, it eventually diminishes as countries attain higher levels of development (Eze & Eze, 2019).

Furthermore, the effectiveness of mass media campaigns aimed at mitigating environmental degradation in Nigeria has come under scrutiny. Despite their noble intentions, these campaigns have struggled to deliver a sustainable solution to the environmental challenges facing the country (Eze & Eze, 2019). In conclusion, comprehensively assessing the economic repercussions of environmental degradation and natural resource extraction in Nigeria necessitates a deep understanding of the intricate web of factors contributing to environmental decline and their interplay."

2.1.2 Types and Causes of Environmental Degradation

Environmental degradation is a growing concern in Nigeria, with various factors contributing to its occurrence.

Types of Environmental Degradation in Nigeria

Coastal erosion: Waves breaking along the coastline

have been identified as the main explanatory factor responsible for coastal erosion in Nigeria (Awosusi, et al., 2020).

Flooding: Flooding in Nigeria is mostly attributed to tidal rise/tidal fall, heavy rainfall, and poor drainage systems (Awosusi, et al., 2020).

Pollution: Pollution is a major type of environmental degradation in Nigeria, with oil spills, gas flaring, and industrial waste being the main sources of pollution (Darkoh, 2018).

Deforestation: Deforestation is a significant type of environmental degradation in Nigeria, with the country losing about 3.5% of its forest cover annually (Akinlo, 2022).

Soil degradation: Soil degradation is a growing concern in Nigeria, with factors such as overgrazing, deforestation, and poor agricultural practices contributing to its occurrence (Akinlo, 2022).

2.1.3 Causes of Environmental Degradation in Nigeria

Population Expansion: The burgeoning population has been associated with heightened environmental degradation in Nigeria. Research indicates a positive correlation between a nation's population growth rate and an increase in environmental degradation (Yahaya & Ibrahim, 2020).

Energy consumption: Energy consumption has been identified as a major cause of environmental degradation in Nigeria, with studies showing that it tends to increase environmental degradation (Awosusi et al., 2020; Ayobamiji & Adediran, 2020).

Trade openness: Trade openness has been identified as a factor contributing to environmental degradation in Nigeria, with studies showing that it tends to increase environmental degradation (Ayobamiji & Adediran, 2020).

Financial development: Financial development has been identified as a factor contributing to environmental degradation in Nigeria, with studies showing that it tends to increase environmental degradation (Ayobamiji & Adediran, 2020).

Foreign direct investment: Foreign direct investment has been identified as a factor contributing to environmental degradation in Nigeria, with studies showing that it tends to increase environmental degradation (Ayobamiji & Adediran, 2020; Akinlo, 2022).

Exploration of Natural Resources: The exploration of natural resources, especially in the oil and gas

sector, has emerged as a significant driver of environmental degradation in Nigeria. Oil spills, gas flaring, and industrial waste are the primary sources of pollution resulting from this exploration (Darkoh, 2018).

In summary, the study highlights the intricate nature of environmental degradation in Nigeria, necessitating a holistic grasp of the multifaceted factors driving its occurrence.

2.1.4 Environmental Sustainability Concepts

Environmental sustainability has garnered considerable attention in Nigeria, prompting numerous studies to explore the multifaceted dimensions of this critical issue. Within the existing body of literature, several key areas have been investigated:

A study by Verla, Enyoh, Ibe, and Verla (2020) examined the status of liquid biofuels in Nigeria. It highlighted the potential of liquid biofuels to contribute to environmental sustainability in the country. However, the study emphasized the need for appropriate tools to assess their environmental impact. In another study, Ayobamiji and Adediran (2020) delved into the factors driving environmental degradation in Nigeria. Their research identified several determinants, including economic growth, trade openness, financial development, energy consumption, and foreign direct investment. These factors were found to increase environmental degradation in the Nigerian context. In a similar vein, a study conducted by Yahaya and Ibrahim (2020) explored the relationship between population growth and environmental degradation in Nigeria. The research revealed a clear link between increasing population and heightened environmental degradation. Moreover, population density, energy resources, and financial progress were identified as contributors to environmental deterioration.

Still on environmental degradation, Akinlo (2022) explored the asymmetric effects of remittances on environmental degradation in Nigeria. The research identified a long-run relationship between remittances and environmental degradation in the country. Importantly, it demonstrated that increases and decreases in remittances had asymmetric effects on environmental degradation.

In the context of listed oil and gas companies in Nigeria, Joyce (2020) conducted a comprehensive review of the literature. The study examined the impact of environmental disclosure on the financial performance of these companies. It found that the practice of disclosing environmental information in

annual reports could result in both positive and negative effects on financial performance. Furthermore, the voluntary nature of environmental disclosure in Nigeria was recognized as a potential source of mixed results. On exploring reports and mass media, Darkoh (2018) conducted a study that assessed the effectiveness of mass media campaigns aimed at combating environmental degradation in Nigeria. While acknowledging the efforts made, such as monthly clean-up exercises, the study noted that these practices did not offer lasting solutions. It further highlighted the challenges in enforcing environmental preservation measures, often falling short of expectations.

In summation, the studies underscore the intricate nature of environmental sustainability in Nigeria. The insights gained from research encompass a wide range of factors contributing to this complex issue. From the role of liquid biofuels and determinants of environmental degradation to the impact of remittances and mass media campaigns, the findings collectively emphasize the need for a holistic understanding to address environmental sustainability effectively.

2.2 Theoretical Framework

Environmental degradation is a growing concern in Nigeria, with various factors contributing to its occurrence. This study aims to assess the economic implications of environmental degradation and natural resource exploration in Nigeria. The theoretical framework for this study is based on the following economic theories:

2.2.1 Porter Hypothesis:

The Porter Hypothesis suggests that environmental regulations can lead to innovation and improved economic performance. It challenges the conventional belief that environmental regulations necessarily harm economic performance. Instead, it proposes that well-designed and well-implemented environmental regulations can drive firms to adopt innovative technologies and processes, leading to cost savings and improved overall performance (Barbier, 2011).

2.2.2 The Environmental Kuznets Curve (EKC)

The Environmental Kuznets Curve (EKC) theory posits that as countries' income levels increase, environmental degradation initially worsens, but at higher income levels, it improves (Olatayo, Andrew, & Ekperiware, 2019). In the case of Nigeria, the EKC hypothesis has been examined in the context of its environmental and economic conditions, particularly regarding oil extraction and air pollution (Echendu, Okafor, & Iyiola, 2022).

2.2.3 The Resource Curse Hypothesis

The Resource Curse Hypothesis suggests that countries rich in natural resources may experience slower economic development due to factors such as corruption and mismanagement (Olatayo, Andrew, & Ekperiware, 2019). In Nigeria, the Resource Curse Hypothesis has been discussed in relation to the oil and gas sector (Ekperusi, Imiwa, & David, 2020).

2.3 Empirical Framework

2.3.1 Studies on Environmental Degradation in Nigeria

Numerous research studies have greatly enriched our understanding of environmental degradation in Nigeria. Adekunle and colleagues (2022) made a significant discovery, revealing a strong and positive connection between economic growth and environmental degradation. They also pinpointed a direct link between heightened energy consumption and increased carbon emissions, shedding light on the complexities of this environmental challenge.

Further reinforcing these findings, the work of Nwodo, Ozor, Okekpa, & Agu (2017) suggested an intriguing pattern. They proposed that economic growth and pollution in Nigeria exhibit a distinctive N-shaped relationship, further illustrating the intricate nature of this issue.

In the pursuit of unraveling this complex topic, Ayobamiji and Adediran (2020) brought additional insights to the table. They highlighted the constructive influence of economic growth on CO₂ emissions while intriguingly noting that foreign direct investment seemed to have a countering effect, potentially reducing CO₂ emissions. Moreover, their research reinforced the idea that both economic growth and increased energy consumption contribute to higher CO₂ emissions, emphasizing the interconnected factors contributing to environmental degradation.

Collectively, these findings stress the immediate necessity for environmental regulation and the widespread adoption of clean technologies in Nigeria. These strategies stand as essential pathways to confront and mitigate the challenges of environmental degradation in the country.

2.3.2 Research on Natural Resource Exploration in Nigeria

Natural resource exploration in Nigeria has been hindered by various factors. The weak Nigerian state and lack of political will to address the underlying causes of insurgency have allowed armed insurgents to control extractive processes, leading to massive resource theft and insecurity (Victor, 2022). The unfair and inequitable distribution of benefits from

resources has caused conflicts, with the government and elite benefiting while host communities face negative environmental impacts (Osimen & Uwa, 2023; Anthony, Ikhide, Osawe & Uwa, 2023). Poor management and degradation of natural resources have exacerbated human insecurity and undermined public safety (Mayowa & Olatunde, 2018).

Despite Nigeria's abundant natural resource potentials, they have been marginally exploited, with over-dependence on crude oil being a major challenge (Jackson et al., 2016). To promote sustainable development, Nigeria should diversify its economy by investing in agriculture and mining, and ensure transparency and accountability in the management of natural resource wealth.

2.4 Review on Policies on Environment, Natural Resources and Climate Change in Nigeria

2.4.1 National Policy on Solid Minerals

The National Policy on Solid Minerals in Nigeria is a comprehensive framework designed to guide the management of solid minerals in the country (NMSMD, 1999). The policy aims to ensure the orderly development of the mineral resources of the country, enhance health and safety in the mining industry, and protect the environment. The implementation of the policy has faced several challenges like inadequate funding, lack of infrastructure, and inadequate technical expertise (Office of the Secretary to the Government of the Federation, (n.d.). The policy has also been criticized for not being effective in achieving sustainable economic growth and development ((NMSMD, 1999). However, it still the potentials to become a significant contributor to the national economy, reducing the country's vulnerability to fluctuations in oil prices.

2.4.2 National Policy on Renewable Energy and Energy Efficiency

The National Policy on Renewable Energy and Energy Efficiency in Nigeria is a comprehensive framework designed to guide the management of renewable energy and energy efficiency in the country. However, the implementation of the policy has faced several challenges, including funding, infrastructure, technical expertise, policy coherence, and private sector involvement (Ayangeaor, 2022). The policy has also been criticized for not being effective in achieving sustainable economic growth and development (Oyewole, 2023). To overcome these challenges, there is a need for increased government funding, private sector involvement, and technical expertise to develop and implement effective renewable energy policies in Nigeria

2.4.3 National Policy on Water Resources

The National Policy on Water Resources in Nigeria is a comprehensive framework designed to guide the management of water resources in the country. The policy highlights the importance of water resources in the economic development of Nigeria. However, the implementation of the policy has faced several challenges, including shortages of water in urban and rural areas, competing water uses, lower level of water supply, and inadequate technical expertise (FMWR, 2016).

The policy has also been criticized for not being effective in achieving sustainable economic growth and development (Oyewole, 2020). To overcome these challenges, there is a need for increased government funding, private sector involvement, and technical expertise to develop and implement effective water resources policies in Nigeria.

2.4.4 National Policy on Environmental Education

The National Policy on Environmental Education in Nigeria is a comprehensive framework designed to guide the management of environmental education in the country (Ogunbode & Ogunbode, 2016). It highlights the importance of environmental education in the economic development of Nigeria. However, the implementation of the policy has faced several challenges, including inadequate funding, lack of infrastructure, and inadequate technical expertise Ogunbode, & Ogunbode, 2016). The policy has also been criticized for not being effective in achieving sustainable economic growth and development (Oyewole, 2020). To overcome these challenges, there is a need for increased government funding, private sector involvement, and technical expertise to develop and implement effective environmental education policies in Nigeria.

2.5 Recommended Policy Implementations to Address the Gaps in the Existing Policies

1. Diversify Funding Sources: Develop mechanisms to diversify funding for policy implementation in each of the mentioned areas (Solid Minerals, Renewable Energy, Water Resources, and Environmental Education). Encourage public-private partnerships, explore international funding opportunities, and establish dedicated funds for these sectors. This will reduce the reliance on government budgets and promote sustainable financing.

2. Enhance Public-Private Collaboration: Promote active involvement of the private sector in the development and implementation of these policies. Encourage public-private collaboration through partnerships, concessions, and incentives to leverage

private sector expertise, investment, and resources in areas like mining, renewable energy projects, water supply, and environmental education.

3. Invest in Technical Capacity Building: Prioritize investment in technical expertise by supporting training and education programs, both within government agencies and in collaboration with academic institutions and industry associations. This will help address the issue of inadequate technical expertise and ensure effective policy implementation.

4. Establish Robust Data Collection and Monitoring Systems: Develop comprehensive data collection and reporting systems to monitor policy progress and outcomes. This will provide policymakers with the necessary information to make informed decisions and ensure accountability. Encourage transparency and regular reporting on policy performance.

5. Promote Policy Coherence and Integration: Ensure that the policies are coherent and integrated across different sectors. Address the issue of policy fragmentation by establishing a coordinating body or mechanism to harmonize policies related to natural resources, energy, water, and education. This will prevent conflicts and promote synergy among different policies.

These recommendations aim to address the core challenges and shortcomings while fostering sustainability, collaboration, and effective governance in each policy area.

3.0 Methodology Research Design

The research design for this study was a cross-sectional survey design. The study used an online survey to collect primary data from respondents. Sampling

The study used a convenience sampling technique to select respondents. The target population were individuals who are knowledgeable about the economic implications of environmental degradation and natural resource exploration in Nigeria. The sample size was based on the number survey forms filled.

Survey Development/ Data Collection

The survey was developed using an online survey tool: Freeonlinesurvey.com. The survey consisted of closed-ended questions. The survey questions were designed to elicit information on the economic implications of environmental degradation and natural resource exploration in Nigeria. The survey was distributed online to the respondents. The survey link was shared through social media platforms such as Facebook, WhatsApp, Twitter, and LinkedIn. The

respondents were given a specific time frame to complete the survey. A total of 261 respondents participated in the survey.

Data Analysis

The data collected from the survey were analyzed using Excel and SPSS. Graphs were used to summarize and depict the data. Inferential statistics such as Multinomial Regression analysis was used to test the hypothesis.

Ethical Considerations

The study adhered to ethical principles such as informed consent, confidentiality, and anonymity. The respondents were informed about the purpose of the study, and their participation was voluntary.

4.0 Data Analysis and Results

Objective 1: To assess the current economic impact of environmental degradation, natural resource depletion, and climate change on key sectors of the Nigerian economy

SECTORS AFFECTED BY ENVIRONMENTAL DEGRADATION, NATURAL RESOURCE DEPLETION, AND CLIMATE CHANGE

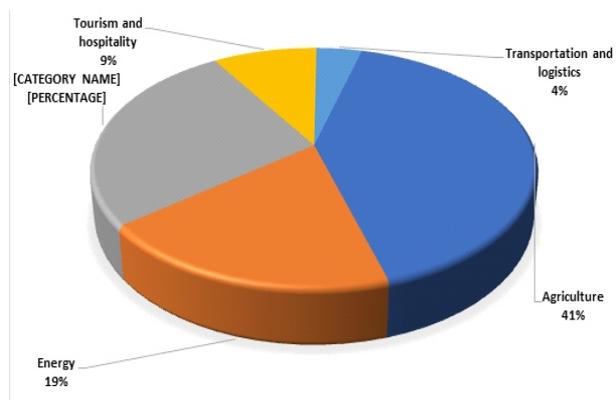


Fig. 1: Pie chart showing sectors affected by environmental degradation, natural resource depletion, and climate change.

Fig. 1 shows that the agriculture sector is much more impacted by environmental degradation, natural resource depletion, and climate change. The chart helps us to identify 2 more sectors (Manufacturing and Energy) that are also adversely impacted.

ECONOMIC CONSEQUENCES OF ENVIRONMENTAL DEGRADATION, NATURAL RESOURCE DEPLETION, AND CLIMATE CHANGE ON THE SECTORS

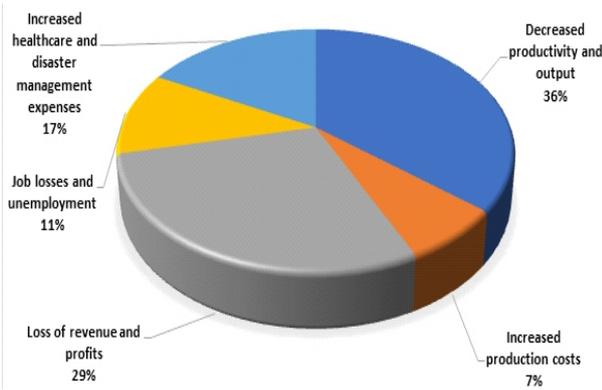


Fig. 2: Pie chart showing economic consequences of environmental degradation, natural resource depletion, and climate change on the sectors.

Fig. 2 shows that the main consequence of environmental degradation, natural resource depletion, and climate change on the sectors is 'Decreased productivity and output', followed by 'Loss of revenue and profit', and 'Increased healthcare and disaster management expenses'.

Objective 2: To examine the effectiveness of existing environmental and natural resource management policies in Nigeria and their contribution to sustainable development

EFFECTIVENESS OF THESE POLICIES IN PROMOTING SUSTAINABLE DEVELOPMENT IN NIGERIA

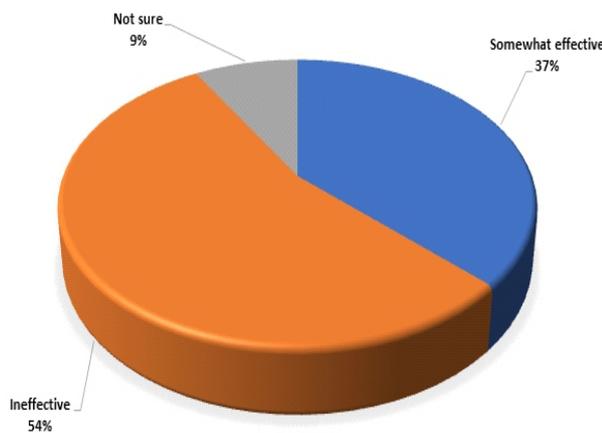


Fig. 3: Pie chart showing the effectiveness of existing environmental and natural resource management policies in Nigeria and their contribution to sustainable development.

From the chart, we can deduce that the policies are ineffective. More than 50% of the 261 respondents said that the policies are ineffective, while only 37% said the policies are somewhat effective.

Objective 3: To determine the relationship between environmental quality, natural resource abundance and economic performance in Nigeria, with a focus on identifying opportunities for sustainable development

Multinomial Logistic Regression

Hypothesis

H₀: There is no significant relationship between economic performance in Nigeria and environmental quality, and natural resource abundance for sustainable development.

H₁: There is a significant relationship between economic performance in Nigeria and environmental quality, and natural resource abundance for sustainable development.

Table 1: Model Fitting Information

Model	Model Fitting Criteria			Likelihood Ratio Tests		
	AIC	BIC	-2 Log Likelihood	Chi-Square	df	P-Value
Intercept Only	565.294	575.988	559.294			
Final	44.661	108.822	8.661	550.633	15	0.000

Table 1 shows that the p-value of the Final (estimated model) is less than alpha (0.05). This means that there is a significant relationship between economic performance in Nigeria and environmental quality and natural resource abundance for sustainable development in Nigeria.

Table 2: Likelihood Ratio Tests

Effect	Model Fitting Criteria			Likelihood Ratio Tests		
	AIC of Reduced Model	BIC of Reduced Model	-2 Log Likelihood of Reduced Model	Chi-Square	df	P-Value
Intercept	44.661	108.822	8.661 ^a	.000	0	.
How would you describe the current state of environmental quality in Nigeria?	374.696	406.776	356.696	348.035	9	0.000
How would you rate the abundance of natural resources in Nigeria?	154.310	197.084	130.310	121.649	6	0.000

The model is:

$$Y = 44.661 + 374.696X_1 + 154.310X_2$$

Where Y = Economic Performance in Nigeria.

X₁ = Rating of current state of environmental quality in Nigeria.

X₂ = Rating of abundance of natural resources in Nigeria.

Table 2 shows that each of independent variables is significant, as their p-values are less than 5%. The implication of this result as regards Nigeria's economic performance is that the impact of environmental quality (whether good or bad) is a strong indicator of economic performance. So also,

the abundance of natural resources. From the study so far, we have discovered that Nigeria's environmental quality is poor due to the exploration and exploitation of natural resources, including oil spillages. This indicates that it has had a significant negative impact on the country's economy.

5.0 Discussion of Results

Fig. 1 highlights that environmental degradation, natural resource depletion, and climate change significantly affect the agriculture sector, which is crucial to Nigeria's economy. Additionally, manufacturing and energy sectors are also adversely impacted. This underscores the importance of addressing these issues to ensure the sustainability of these sector.

Fig. 2 reveals that the main economic consequence of these challenges is decreased productivity and output, followed by loss of revenue and profit, and increased healthcare and disaster management expenses. These consequences have direct and indirect economic implications, affecting various aspects of the Nigerian economy. Fig. 3 demonstrates that a significant portion of respondents (more than 50%) perceive existing policies related to environmental and natural resource management in Nigeria as ineffective. This raises concerns about the need for more effective policies to promote sustainability and address the issues identified in Objective 1.

Fig. 4 reveals that public and consumer demand for sustainable products/services is the primary economic driver for implementing sustainable policies and practices in Nigeria's environmental and natural resource sectors. Access to international markets and funding opportunities also play a significant role.

Fig. 5 highlights that insufficient policy enforcement and compliance mechanisms, as well as short-term profit-seeking behavior, are major barriers to the implementation of sustainable policies and practices. Addressing these barriers is crucial to promoting sustainability and mitigating economic challenges.

The results of the multinomial logistic regression analysis (Table 1) support the hypothesis that there is a significant relationship between economic performance in Nigeria and environmental quality, as well as natural resource abundance. The model indicates that economic performance is influenced by the current state of environmental quality and the abundance of natural resources.

Table 2 further confirms the significance of both independent variables, as their p-values are less than

5% respectively. The model suggests that environmental quality and natural resource abundance are strong indicators of economic performance in Nigeria. Importantly, the study finds that Nigeria's environmental quality is poor due to the exploration and exploitation of natural resources, including oil spillages, which negatively impacts the country's economy.

6.0 Summary of the Study

In Nigeria, the intricate interplay between environmental degradation and natural resource exploration holds significant economic consequences, molding the nation's socio-economic landscape. This study delves into this complex dynamic, seeking to illuminate the profound economic implications, challenges, and opportunities it brings.

Environmental degradation in Nigeria presents a multifaceted challenge, encompassing issues like deforestation, pollution, soil degradation, and coastal erosion. These issues pose serious threats to ecosystems, human well-being, and the national economy. Factors such as population growth, energy consumption, trade openness, financial development, and foreign direct investment have been identified as key drivers of environmental degradation. While economic growth often exacerbates environmental issues, there's a suggestion that as nations advance, environmental degradation may subside, hinting at an Environmental Kuznets Curve. Despite well-intentioned efforts, mass media campaigns have struggled to deliver lasting solutions, often falling short of expectations.

Natural resource exploration in Nigeria, especially in the oil and gas sector, has fueled economic growth while simultaneously presenting challenges like resource depletion, social tensions, and environmental degradation. Armed insurgents have taken control of extractive processes, leading to significant resource theft and insecurity. The unequal distribution of resource benefits has sparked conflicts, while poor resource management and degradation have heightened human insecurity and undermined public safety. Nigeria's heavy reliance on crude oil presents a notable hurdle to diversifying its economy and ensuring transparent resource wealth management.

This study was guided by economic theories, including the Porter Hypothesis, the Environmental Kuznets Curve, and the Resource Curse Hypothesis. These frameworks offered a solid foundation for comprehending the economic implications of environmental degradation and natural resource

exploration in Nigeria. Empirical research findings indicated a complex relationship between economic growth, energy consumption, foreign direct investment, and CO₂ emissions, highlighting the interconnected factors driving environmental degradation.

The collective findings underline the urgent need for environmental regulations and the widespread adoption of clean technologies in Nigeria. These strategies are essential for addressing and mitigating environmental degradation challenges. Furthermore, diversifying the economy by investing in agriculture and mining, alongside ensuring transparency and accountability in resource wealth management, is crucial for achieving sustainable development and nurturing economic resilience.

7.0 Conclusion

In conclusion, this research significantly contributes to our understanding of the economic implications of environmental degradation and natural resource exploration in Nigeria. It offers a comprehensive perspective that can inform evidence-based decisions and the formulation of sustainable policies to tackle Nigeria's unique challenges and opportunities. By addressing these issues and embracing sustainable practices, Nigeria can position itself for a future characterized by economic resilience and sustainable development, heralding a brighter future for the nation and its people.

8.0 Recommendations

The following recommendations are derived from the study:

1. Enhance and enforce environmental regulations to curb environmental degradation, particularly in industries like oil and gas.
2. Establish stringent pollution control measures to mitigate the adverse effects of resource exploration.
3. Encourage the widespread adoption of clean and sustainable technologies across industries.
4. Promote eco-friendly energy solutions and resource management practices.
5. Reduce overreliance on a single resource, such as

crude oil, by investing in and developing other sectors like agriculture and mining.

6. Institute mechanisms to ensure transparency and accountability in the management of natural resource wealth, reducing the risk of corruption and mismanagement.
7. Integrate research findings into policymaking processes to ensure that policies and regulations are evidence-based and responsive to the evolving economic and environmental landscape.

9.0 Recommendations for Further Studies

Based on the study, the following recommendations are made for further studies:

1. Conduct longitudinal studies to assess the long-term economic and environmental impacts of environmental regulations and resource management policies in Nigeria.
2. Undertake comparative studies with other resource-rich countries to identify best practices and lessons that can be applied to Nigeria's context.
3. Explore the specific health implications of environmental degradation in different regions of Nigeria and the associated economic costs.
4. Evaluate the effectiveness of specific environmental policies and regulations in mitigating environmental degradation and their influence on economic performance.
5. Study the effectiveness of climate change mitigation strategies and their economic implications in Nigeria, focusing on adaptation and resilience measures.
6. Analyze the interconnectedness of different economic sectors and their response to environmental degradation, considering potential synergies and trade-offs.
7. Investigate the economic impact of international collaborations and agreements on environmental sustainability and resource management in Nigeria.

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Regulation and Innovation in the Financial Services Sector: Proposing the Jigsaw Regulatory Framework for Innovative Financial System Landscape



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Abstract

Innovation is ingrained in the Financial Services Sector, but regulators globally are grappling with its implications. This article seeks to address gaps in the regulation of innovation in the financial services ecosystem regulation. It therefore reviews literature on existing regulatory models by examining the strength and deficiencies towards proposing a new approach. A proposal for a new regulatory approach, the Jigsaw Framework for Regulating Innovative Financial Services Landscape is elaborated within the article. The framework emphasises regulatory flexibilities, stratifies the financial system and offers a stepwise devolution of regulatory responsibilities. Notwithstanding regulatory and supervisory standards are upheld with a call for responsive enhancements mechanism.

1.0 Introduction

The financial system has served purpose for the development of the economy over the years. The mobilisation of funds and its deployment into productive areas for the accumulation of capital and growth in outputs remains the essence of the financial system. However, the forms, arrangements, processes, technology, instruments evolve in line with the sophistication and requirements of the economy served by the financial system and oftentimes it positions ahead towards propelling the economy to higher levels of growth. The financial system therefore sets pace for the economy and influences shifts in outputs and development through intermediation process. The last two decades experienced phenomenal developments in the financial system globally at speeds unprecedented in centuries. Indeed, one may posit that the effects of both economic cycles and landmark socio-political events have been of less significance as that of technological developments and innovation especially in the financial system.

The ongoing transformation of the financial system globally by elements of the fourth industrial revolution forces the re-imagining of the models and operations of institutions, markets and infrastructures of the financial system. Convergence in the subsectors of the financial sector, globalization of financial services provisioning and consumption, massive technology multinationals facilitating cross-border interaction and commerce, redefinition of the labour mobility by digital natives are some outcomes of the changing models and operations of financial system which is challenging the policy and regulatory arrangements globally.

Public policy and regulation on the financial system cannot continue to be reactive in the face of adoption of technologies, infrastructure and models such as artificial intelligence, blockchain, smart contracts, cloud computing, big data, etc., in the financial services sector. The policy responses globally on blockchain and cryptocurrency following the bitcoin white paper of 2009, and subsequent applications illustrate the flaw within the current global financial regulatory arrangement. Approaches adopted by most countries vary yet none was sufficient to address the outcomes that the financial system is grappling with. Approaches of outright prohibition, wait-and

see, admission, and alternatives are challenged in achieving key regulatory objectives of consumer protection, competition, stability and public confidence in the financial system. There are jurisdictions that initially admitted or embraced cryptocurrency and eventually banned it, in view of the distortion it created in their markets. In another vein, there are those that cautiously studied developments to understand its features but eventually classified cryptocurrency as assets yet confronted with managing risks of the markets created. Those who banned cryptocurrency outrightly also could not sustain it as they realised that they lack the wherewithal to enforce with the consequent shadow status attained by cryptocurrency in such environments and cross-border limitations.

The fluidity of the re-configured financial services landscape defies freezing of regulatory stance and demands continuous evaluation, changes and re-evaluation and further changes. Can regulation afford such a state of flux if it will achieve its objectives? This paper therefore seeks to propose models that afford required flexibility for financial services regulation that will aid the internalization and optimisation of the positives of the fourth industrial revolution while enhancing the capabilities for managing risks.

This paper evaluates the options available to financial services regulators in the fourth industrial revolution age. Regulators appreciate the opportunities of the technology age and embrace them but are wary of the risks it poses to the attainment of their objectives. Following this introduction, the paper examines the inadequacies of the current regulatory posture for managing innovation in the financial services sector. The next section will propose and introduce three models of regulation for the consideration of the financial services regulators which will address the challenges. Thereafter, a review of the robustness of the proposed options is outlined and the paper concluded.

2.0 Literature Review

2.1 Regulation and Innovation in the Financial Services Sector

The pace of innovation in the financial services sector is astounding. However, regulation has not been keeping the pace. There has therefore been in many cases haphazard regulatory responses to innovation

in the financial services space. Notwithstanding, some propositions have been made and tried by various regulators across different jurisdictions. Approaches adopted by regulators include:

2.2 Activity-Based Regulation

The focus of activity based regulatory approach is on the product or service being offered by the entity rather than the classification of the entity as subject of regulation. This affords the opportunity for regulator to regulate any entity as long as the entity is carrying on a business under its regulatory purview. The advantage of this approach is that applicability of regulation to any entity no matter its primary line of business. It expands the reach of the regulator and enables regulator to dimension its risks landscape. There are arguments that it aids management of systemic risk. (University of Michigan Center on Finance, Law, and Policy, 2018).

However, the approach may be challenged by turf war among regulators and poor enforcements. Market structure and competition rules may also be unduly affected by the activity-based approach to regulation. There is also the tendency to stepside rules applicable to financial market infrastructure especially with the platform based approach of innovators in the financial services sector.

Similarly, there is the likelihood of a one-size fits all approach to regulating the activity. The implication of other lines of business of the service provider for the activity regulated may also be a challenge for regulators as expertise in those business offerings may be limited. While this challenge may be tackled through consolidated supervision, the level of cooperation among regulators may entrench it.

2.3 Proportionate Regulation

Proportionality in regulation requires that the regulation for any institution or activity should consider the size, complexity, scope of operations and importantly, the risks introduced by an entity or its activity to the financial system and direct regulation that is commensurate to the aforementioned factors. This approach seeks to address blanket regulation or one-size-fits-all and the cost that comes with it. When combined with activity-based regulation, it enjoys positive reviews as very appropriate to encourage innovators in the financial services sector. However, the challenge that comes with it, is the possibility of

tilting competition as it may be to the advantage of start-ups and Fintech and smaller participants. It may also be unresponsive to growth and diversities that innovators nimbly introduce on-the-go as they enjoy acceptability in the market. When not adequately backed by adequate oversight, it may encourage arbitrage and deliberate avoidance of rules as noted by (Grennan, 2022) which demonstrated the possibility of entities using technology or process re-engineering to avoid classifications that could bring them under regulatory focus. (Grennan, 2022) stated as follows:

“Importantly, the Howey test and the Ethereum example (i.e., the fact that Ethereum is not considered an investment contract) further demonstrate how regulation shapes innovation. The June 2018 speech, when SEC Director William Hinman explained why Ethereum was not an investment contract, coincides with the consolidation, rapid development, and apparent success of many DeFi startups that run on the Ethereum blockchain.

Moreover, a prominent application of DeFi is “staking,” which appears to be purposefully designed to bypass the Howey test. When individuals stake their own tokens (“stakers”), they either delegate their right to validate transactions while keeping custody of the tokens or they both delegate this right and transfer custody of the tokens for staking. Validating new transaction blocks earns rewards for the stakers in the form of created tokens. Delegating is intended to increase member participation by allowing staking service providers to perform the staking function on behalf of individuals. If analyzed before a court, the Howey test part (iii), relating to the expectation of profits, is unlikely to be met since staking is done to maintain the value of the staker’s investment and secure the overall network rather than to make a profit.”

Proportionate regulation remains a veritable approach, however there is the need to strengthen it to address the loopholes that may be inadvertently created by its application.

2.4 Self-Regulation

The definition of regulation by (Brian, 2016) takes a very expansive view of regulation, thereby given opportunity to propagate other forms of regulation. He defined regulation and regulators as “rules (whether enshrined in official law, found in private

contract, or enforced by the market) that govern how an activity is conducted, and provide a means of redress or enforcement if the rules are violated. Regulators are any actors who enforce those rules.” In the context of this definition, there opportunities to explore different forms of self-regulation. Self-regulation purely by contracts among parties using the instrumentality of the judicial system to arbitrate or enforce; self-regulatory organisation established by market participants and self-regulation by acceptable standard market practices.

Self-regulation affords operators or stakeholders the opportunity to address issues of conduct & consumer protection, risk management, competition and to acceptable extent prudential regulation within a market. It is considered nimbler and more responsive than traditional government regulation as it is closer to the market and have in-depth appreciation of issues in the market. However, it could be overly influenced by entrenched interests within the market and skew competition or implement undue barriers. An alternative consideration for self-regulation is as enunciated by (Marcinkowska, 2013) who calls for the “golden mean”, a balance between de-regulation and regulation which self-regulation should typify. The concept is to take the advantage of the benefits of the two approaches.

3.0 Future of Financial Services Regulation: The Jigsaw Framework for Regulating Innovative Financial System Landscape

A review of the speed of innovation and the vivacity of the application of technological development to financial services provisioning through hitherto unimagined models calls for a re-imagining of the regulatory methodologies. In this section, an attempt is made to propose a new framework for regulation which would meet the pre-requisites for effectively addressing risks associated with rapid innovation in the financial services industry (FATF, 2017). Matrix of regulation for each activity or related activity, operations or business scaled in the order of complexity of operational model, integration/interface and level of entrenchment of institution within the market.

Regulation in the age of rapid innovation is a jigsaw puzzle which requires a framework within which it can

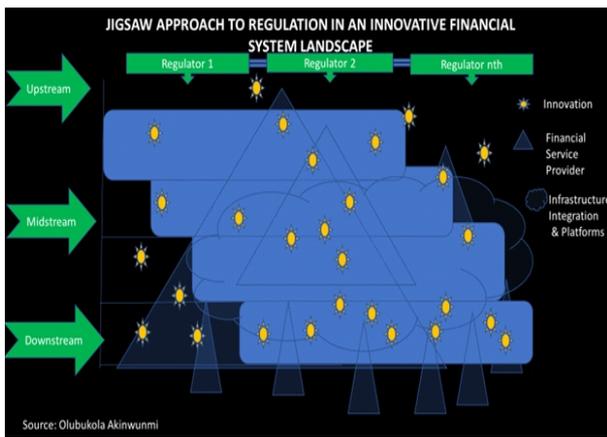


Figure 1

The proposed framework conceptualizes regulation of innovation within the financial services landscape with classification of financial services providers, stratification of regulation into tiers for devolving regulatory responsibilities, and regulatory stakeholders' interaction.

3.1 Classification of Financial Services Providers

Financial Service Providers are considered in an innovative financial ecosystem as a super mall with varying services and responsible to various regulators depending on which activity or operations, they carry out either directly or indirectly. This is done under the assumption that innovation can spring from any part of the landscape with greater tendency for innovation adduced to the downstream operators. The classification of Financial Services Providers are as follows:

3.1.1 Downstream Operators

Downstream operators attend to customers at the retail level. These operators are considered to have high tendency for innovation across various regulated activities. They are held to downstream regulation at that level of operation. The framework takes into cognisance the possibility of growth vertically to upper streams and horizontal to different regulatory spheres. Financial Service Providers at the downstream are subjected to enforcement of regulation through collaborative arrangements of self-regulatory initiatives and/or organisations and government regulators in which the government regulators take the back seat and only intervene when absolutely necessary to address systemic issues

that could arise or are imminent.

3.1.2 Midstream Operators

The operators at the midstream are more complex and may be operating across the three levels. Midstream operators have a portfolio of services offered to downstream operators and may also be or double as platform or infrastructure providers. Midstream operators also have assets which are of interest to downstream operators as well as upstream operators. They are capable of scaling rapidly to upstream giants and acts a hub and/or hand-holders for many downstream operators. Notwithstanding, the collaborative stance of midstream operators they are competitive, and they hope to grow their portfolio through partnerships and collaboration to challenge upstream operators. Midstream operators contend with regulatory focus of government regulators while also acting as standard bearers of self-regulatory initiatives in the industry. They are nimbler to respond to official regulation and also leverage partnerships and relationships to develop agreeable market-led guidelines for the landscape due to their large partnership surface in the industry.

3.1.3 Upstream Operators

The upstream operators are big and complex participants in the financial system. They have breadth and depth, usually market makers and offering products, services and platforms to all segments of the industry as well as competing for retail customers (World Economic Forum, 2015). Upstream operators are also innovative but consume innovation from downstream and midstream more than they innovate. Their back-office assets are usually attractive to downstream operators, hence they also partner and integrate downstream operators as well as midstream operators who are exploring greater breadth and depth.

They are bastions of regulation and are directly responsible to government regulators. Upstream operators also play a very important role in self-regulatory initiatives. They face stringent supervisory scrutiny and portend systemic implications for government regulators.

3.2 Stratification of Regulation into Tiers

The applicability of regulation under the Jigsaw Framework is stratified across the streams and based on activities. The various strata and their components

are enunciated further as follows:

3.2.1 Upstream Regulation

Regulation at the Upstream Tier is as provided by the government regulatory agencies and holds out the strictest principles in ensuring soundness and stability of the financial system. It focuses greater attention to systemic issues and leverages risk-based supervisory approach. At this tier, various regulatory agencies implement a robust information sharing channels on all operators and on the various sub-sectors of the industry. Regular engagements are held across jurisdictional spheres and protocols for inter-relationships are well defined for purposes of coordinated regulatory and supervisory actions. Suite of regulation include corporate governance, prudential regulations, conduct and competition, money laundering and cross-border issues, etc. Upstream regulation percolates downward through the standard regulation that this layer upholds. It also reviews self-regulatory initiatives which may define regulation down the stream to other layers.

3.2.2 Midstream Regulation

Midstream regulation is focused on instilling discipline in the operations of market infrastructure, platforms and partnerships. It aims at fostering healthy ecosystem for both innovation and stability. It is the fulcrum for balancing innovation with financial system stability objectives. Rules are defined by operators for smooth functioning of the market infrastructures, best practices are agreed to accommodate all tiers and ensure efficiency, access rules are carefully cascaded to reflect depth and breath of activities of operators. Upstream regulators hold occasional review engagement with self-regulatory organisations or self-regulatory boards to agree broad areas of concern and provide guidance. It is the testbed for the assimilation of innovation in the financial system.

3.2.3 Downstream Regulation

Downstream regulation is the base regulatory strata that emphasises innovation and moderates largely on minimum acceptable standards on fit and proper test for promoters and their innovation while serving as the gate for filtering innovation (Akinwunmi, 2017). Midstream and the Upstream operators are vanguards of regulation on this tier. Downstream regulation accommodates alternatives to resolving

regulatory rigidities. Upstream regulation may apply survey-type feedback mechanism to appreciate issues at the downstream level.

3.3 Regulatory Stakeholders and Collaborations

The Jigsaw Framework for regulation in an innovative financial system landscape provides for continuous, seamless interaction of regulatory institutions with instrumentalities that make for continuous and consistent sharing of information, protocols for addressing cross-jurisdictional matters and systemic issues. The stakeholders include government regulatory agencies, self-regulatory organisations, industry associations, infrastructure or platforms, private regulatory initiatives boards etc. The application of the regulations across this spectrum is risk-based, situational, activity-based and proportionate. Lead regulatory stakeholders in the Downstream include self-regulatory initiatives /organisations and Midstream and Upstream operators.

In the Midstream, regulatory leadership is the responsibility of strong industry self-regulatory organisations under the strict oversight of the government regulatory agencies. Government agencies however also has a strong supervisory and enforcement operations in the Midstream. The responsibility for regulation and supervision in the Upstream is for the Government regulatory agencies. The agencies maintain a collaborative and united front, share regulatory and supervisory technology and interact regularly on systemic matters.

4.0 Assumptions of the Jigsaw Framework for Regulating Innovative Financial System Landscape

The assumptions for the Jigsaw Framework to operate effectively and efficiently are as follows:

- i. Clear legal backing for the framework with robust provisions on jurisdictional delineation of regulatory responsibilities and collaborative mechanisms;
- ii. Strong institutional capabilities in terms of resources, processes, and systems;

- iii. Responsive legislative practices on regulatory matters
- iv. Adaptation of applicable existing global standards
- v. Practical and clear cross-border protocols

5.0 Conclusion and Recommendations

Innovation in financial services has become highly pervasive and systemic. It is a permanent feature that regulatory models should incorporate as an integral part of the financial system. The current regulatory approaches continue to evolve yet struggles to effectively keep pace with the agility of the current financial services ecosystem. Global regulatory and supervisory standards, such as the Basel Core Principles for Banking Supervision and the Principles for Financial Market Infrastructure by Bank for International Settlements, remain relevant with necessary adaptations and modifications.

It is therefore recommended that a stepwise devolution of regulatory responsibilities across a stratified financial system landscape that accommodates flexibilities in the application of regulatory and supervisory powers is required.

In addition, Legislative and regulatory flexibilities should be entrenched within the laws and the legislative process of respective countries while adaptive approaches should be adopted in instituting regulatory and supervisory operations. Institutionalisation of self-regulatory initiatives and other alternative regulatory mechanisms is required to promote collaborative stance within regulatory framework.

Therefore, global regulatory and supervisory standards should be subjected to nimbler and responsive protocols for enhancements by standard setting bodies such as Financial Stability Board, Bank for International Settlement, etc., with a view to addressing the mutative nature of the financial system.

This article provides a basis for further discourse by interested stakeholders (including incumbents, Fintechs, regulators and policy makers, standard setting bodies and consumer groups) to debate, trial, review and enhance the proposed Jigsaw Framework for regulating an innovative financial system landscape.

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