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Impact of Fiscal Policy on Economic Performance in Nigeria: 1981-2020

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Abstract

This study examined the impact of fiscal policy on economic performance in Nigeria (1981-2020). The Augmented Dickey-Fuller unit root test was employed to establish the stationarity of the variables, Johansen co-integration was used to determine the existence of a long-run relationship between fiscal policy and economic performance while ECM was employed to determine the speed of adjustment of the variable to long-run equilibrium at one lag selected. The findings were that there was evidence of a long-run equilibrium relationship between fiscal policy and economic performance in Nigeria. It was found that government total expenditure has a positive and significant long-run impact on economic performance proxies real GDP, human development index (HDI) but negative impact on poverty level in Nigeria while on the other hand, public debt has a positive and significant impact on human development index but positive and insignificant impact on poverty level in Nigeria. Lastly, public debt has a negative impact on the RGDP in Nigeria. From the conclusion, the recommendation made included; anti-corruption agencies like the Economic and Financial Crimes Commission (EFCC) and Independent Corrupt Practices Commission (ICPC) should be merged to avoid wastages in government expenditure.

Keywords: Economic Performance; Fiscal Policy; Human Development Index; Real Gross Domestic Product; Poverty

JEL: E61, E62

1.0 Introduction

Fiscal policy has long been associated with the use of taxes and public spending to affect a country's economic activity. The budget of the government is where fiscal policy is implemented. The most vital aspect of a public budget is its use as an instrument to manage an economy (Omitogun & Ayinla, 2007). Fiscal policy is a deliberate act of government that entails the use of government spending, taxation and borrowing to control the pattern of economic activities, level of output growth, employment, inflation and employment (Ugwanta, 2014). The growth impact of fiscal policy has generated a huge amount of theoretical and empirical work during the last decade. Economic growth is considered as a key macroeconomic objective of a country and an increase in government expenditure on socio-economic and physical infrastructure

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encourages economic growth, as well as expenditure in health and education, which stimulates the rate of growth of national output (Barro, 1990). Infrastructure spending, such as roads, power, communication, and railways, lowers production costs, boosts private sector investment, and boosts firm profitability, boosting economic growth. Monetarists, on the other hand, believe that increased government spending stifles economic progress. Higher amounts of government spending, according to this school of thinking, tend to lower an economy's overall performance.

According to Oshinowo (2015), the literature on the function of fiscal policy in boosting economic growth has two sides. The first viewpoint holds that the government's support for knowledge, research, and development, productive investment, law and order, and the provision of public services may boost growth in the short and long term. More so, Nigeria's potential for long-term economic growth and development has gone untapped over time. It's discouraging that, despite the country's vast natural and human resources, and despite a growing tendency in public spending year after year, the economy has consistently underperformed. Corruption, bureaucracy, political instability, lack of accountability and transparency, bad governance, and a lack of visionary leaders have all been blamed for the poor growth of the Nigerian economy by policy analysts, economists, and other experts. Asaju, Adagba, and Kajang (2014) added that the misapplication of monetary and fiscal policies and complications in the adoption of non-market friendly tools constituted major challenges to realizing Nigeria's fiscal objectives. The public sector in Nigeria, which is intended to drive the economy through fiscal policies, has remained inefficient in terms of service delivery, infrastructure deterioration, a high rate of corruption, and a lack of accountability and probity in the administration of public policies and resources. As a result, unemployment is increasing, inflation is growing, GDP is slowing, real wages are falling, and poverty is rising. In light of this, the research will look at the impacts of fiscal policy on Nigeria's economic performance from 1981 to 2018. As a result, the study's main objectives are:

- To investigate the impact of overall government spending on Nigeria's economic performance.
- To look at the impact of Nigeria's public debt on the country's economic performance.

This paper is divided into five sections to fulfil these goals, with the introduction as the first. The second section is a literature review. The methodology is examined in the third section. The fourth section focuses on the presentation and discussion of results. The summary, findings,policy recommendations and contribution to knowledge are all covered in section five.

2.0 Review of Related Literature

2.1 Theoretical Review

2.1.1 Endogenous Growth

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Fiscal policy, according to "endogenous growth theory," may influence both the level and pace of increase of per capita production. Endogenous growth models indicate that an increase in productive spending supported by non-discriminatory taxes will boost growth, but distortionary taxation has an unclear impact. In the latter situation, there is a level of productive spending that maximizes growth, which may or may not be Pareto efficient (Irmen-Kuehnel, 2008). Furthermore, growth will be neutral if the non-productive expenditure is funded by non-discriminatory taxes, but growth would be negative if distortionary taxes are employed.

2.1.2 The Keynesian Hypothesis

The Keynesian Theory of an aggressive macroeconomic policy has extensively discussed the role of fiscal policy in achieving macroeconomic objectives. Demand management measures may and should be utilized to improve macroeconomic performance, according to the Keynesian approach. An active macroeconomic policy entails adjusting monetary and fiscal variables at the levels considered to be required to fulfil the government's goals in each period. The private sector is intrinsically unstable, according to Keynesian economics. The components of aggregate demand are subject to frequent and quantitatively significant disruptions. Full employment, a steady price level, the absence of major deviations of production from its equilibrium time course, an acceptable rate of economic growth, and equitable distribution of income, and a balance of payment equilibrium are the basic macroeconomic objectives that are not in dispute. According to Keynesian theory, withdrawing expenditure from the economy decreases aggregate demand and stabilizes prices.

2.1.3 Growth Theory (Classical)

The classical growth theory is the earliest hypothesis in the literature on growth. Thomas Malthus is largely linked with the classical growth hypothesis. In summary, the key points of Jhingan's (2007) classical growth theory are as follows: (i) As a result of technical advancements, the amount of capital and the marginal product of labour both increase. (ii) As the economy expands, so does the standard of living and the population. (iii) As the population grows, labour productivity decreases (more individuals but the same amount of capital). (iv) The GDP per capita will decrease once more. The population will stop growing when GDP per capita falls to a level just high enough to protect the population from starving. (v) Capital destruction, such as via war, has the opposite effect.

2.2 Empirical Review

Taiwo and Agbatogun (2011) in their paper analyze the implications of government spending on the growth of Nigeria economy over the period 1980-2009. Using Johansen co-integration, unit root test and error correction model, it was discovered that total capital expenditure, inflation rate, degree of openness and current government revenue are significant variables to improve growth in Nigeria. In the final analysis, future expenditure on capital and recurrent should be

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managed along with adequate manipulation of other macroeconomic variables to ensure steady and accelerate growth.

Isiaka and Raheem (2011) examined the impact of fiscal and monetary policies on the level of economic activities in Nigeria proxied by the GDP. The OLS regression approach was adopted and the result showed a long-run relationship between the variables used, that is, government capital and recurrent expenditures, taxes and money supply. It was also found that government capital and recurrent revenues positive relationship with the GDP but this relationship is insignificant. Also, tax and money supply were not significant in explaining the gross domestic product.

Onuorah and Akujuobi (2012) examined the trend and empirical analysis of public expenditure and its impact on the economic growth in Nigeria. The study employed Johansen Co-integration and VEC and found that RGPE established a long run relationship with RGDP. Finally, there is no statistical significance between public expenditure variables and the economic growth in Nigeria. The study recommended that government should embark on realistic policy implementation with sincere fiscal and monetary policies in place that can monitor to a greater extent and help in the sustainability for remarkable growth to be recorded in Nigeria.

Nworji, Okwu and Obiwuru (2012) examined the effect of public expenditure on economy in Nigeria for the period 1970 to 2009. The study analyzed the effect of public government spending on economy in Nigeria based on time series data on variables considered relevant indicators of economic growth and government expenditure using OLS multiple regression model based Nigerian time series data on the gross domestic product (GDP), and various components of government expenditure. The study showed that capital and recurrent expenditure on economic services had an insignificant negative effects on economic growth during the study period. Consequently, the study recommended more allocation of expenditures to the services with significant positive effects.

Chude (2013) investigated the influence of government spending on Nigerian economic growth. Using a co-integration error correction model, this paper examines the impact of public education spending on economic development in Nigeria from 1977 to 2012. (ECM). The findings show that overall education spending is statistically significant and has a long-term positive link with Nigerian economic growth. The researchers find that variables both exogenous and endogenous to government spending in Nigeria have a significant influence on economic growth. The technique of data collection was clearly described in the study.

Aregbe and Greg (2015) looked at the influence of government expenditure on Nigerian economic development from 1970 to 2010. The Central Bank of Nigeria statistical Bulletin provided the data for this study. The findings reveal that overall government spending on health and transportation is positively and strongly connected to economic

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growth, whereas agricultural spending increased by 0.7 percent. As a result of the country's present economic diversification push, this has occurred.

Obayori (2016) used co-integration and ECM techniques to study Nigerian fiscal policy and unemployment from 1980 to 2013. The data show that there is a long-term link between fiscal policy and unemployment. As a consequence of the findings, it is concluded that fiscal policy is beneficial in lowering Nigeria's unemployment rate.

Between 1980 and 2015, Odetayo and Adeyemi (2017) looked at Nigeria's fiscal policies and economic development. To examine the impact of government expenditure and income on production growth in Nigeria, the study used an error correction model and an autoregressive distributed lag model. It shows that government revenue, government spending and the fiscal deficit grew massively within the period considered. The results equally revealed that fiscal policy is weakly sustainable in Nigeria.

Aliu, Bello, Ndagwakwa, Wazamari, Zima, Solomon, Salam, Gbadebo and Shettima (2018) examines the impact of fiscal policy on economic performance in Nigeria between 1981 and 2016. Fiscal policy is represented by government total expenditure, government total revenue and direct tax. A model was developed in which economic growth (proxy as economic performance) is expressed as a function of government total expenditure, government total revenue, direct tax, capital (represented as gross capital formation) and labour (represented as employment rate). The study covered 36 years ranging from 1981 to 2016. The econometric techniques of Augmented Dickey-Fuller test, Co-integration test and Error Correction model estimation. The study suggested that; Government should enhance investment in productive expenditure including expenditure on education, health, manufacturing, mining and agriculture and also ensure that funds meant for the development of these sectors are properly utilized.

3.0 Methodology

3.1 Model Specification

The study investigates the impact of Nigeria's fiscal policies on the country's economic performance. The model was adapted from Aliyu, Bello, Ndagwakwa, Zirra, Salam, Gbadebo, and Mohammed (2018), who investigated the influence of fiscal policy on Nigerian economic performance and described their model as RGDP= f. (GTEXP, GTREV, DTAX). However, utilizing government total expenditure (GEXP), public debts (POL), economic growth (RGDP), human development index (HDI), and poverty level(POL). The study's model is thus based on the following disaggregated functional connection, which may be expressed implicitly as follows:

RGDP= F (GEXP, PUD)..... 3.1

POL= F (GEXP, PUD) 3.2

HDI =F (GEXP, PUD) ……..…….3.3

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GTREV and DTAX were removed from the model for this research, HDI and POL are added, and the model is presented.Explicitly, equation 3.1, 3.2 and 3.3 can be written as:

$RGDP_t = \beta_0 + \beta_1 GEXP_t + \beta_2 PUD_t + \mu_{1t}$ 3.4

$POL = \alpha_0 + \alpha_1 GEXP_t + \alpha_2 PUD_t + \mu_{2t}$ 3.5

$HDI = \lambda_0 + \lambda_1 GEXP_t + \lambda_2 PUD_t + \mu_{3t}$ 3.6

Log-linearizing equation 3.4, 3.5 and 3.6 above, we obtain equation 3.7, 3.8 and 3.9

$LRGDP_t = \beta_0 + \beta_1 LGEXP_t + \beta_2 LPUD_t + \mu_{1t}$ 3.7

$POL = \alpha_1 + \alpha_2 LGEXP_t + \alpha_2 LPUD_t + \mu_{2t}$ 3.8

$HDI = \lambda_0 + \lambda_1 LGEXP_t + \lambda_2 LPUD_t + \mu_{3t}$ 3.9

Where: RGDP = Real Gross Domestic Product Growth Rate (proxy as economic performance)

GEXP = Government Expenditure, PUD = Public Debt, POL = Poverty Level (proxy as economic performance), HDI= Human Development Index (proxy as economic performance)

U_t = the stochastic term or the unexplained variation in GDP growth rate, t = the time period. Log= Natural Logarithm

A priori Expectation

It is expected that based on a priori functional relationship between dependent and independent variables the coefficient of government expenditures which are often used to undertake new projects or investments. The expected relationship between government expenditure and economic performance (proxy RGDP and HDI) is positive while negative atthe poverty level. The coefficient of public debt is also expected to be positively related to economic performance (proxy RGDP and

3.2 Data Estimation Technique

The Augmented Dickey-Fuller (ADF) test was adopted to test the time-series properties of data and determine the order of integration to stationarity. Co-integration is applied to determine the existence of a long-run relationship between fiscal policy variables and economic performance. ECM was employed to determine the speed of adjustment of the variables to long-run equilibrium as shown in the following equations:

$$\Delta RGDPt = \alpha_0 + \lambda ECM + \sum_{i=1}^{n} \beta \Delta RGDPt - 1 + \sum_{i=1}^{n} \delta \Delta GEXPt - 1 + \beta \Delta PUDt - 1 + \epsilon t \ldots 3.10$$

$$\Delta HDIt = b_0 + \gamma ECM + \sum_{i=1}^{n} \vartheta \Delta HDIt - 1 + \sum_{i=1}^{n} \eta \Delta GEXPt - 1 + Z \Delta PUDt - 1 + \epsilon t \ldots\ldots 3.11$$

$$\Delta POLt = \eta_0 + \theta ECM + \sum_{i=1}^{n} Þ \Delta POLt - 1 + \sum_{i=1}^{n} \iota \Delta GEXPt - 1 + \alpha \Delta PUDt - 1 + \epsilon t \ldots\ldots 3.12$$

Where Δ is the first difference operator, α_0, b_0, η_0 are constant parameters of the models, and β, θ, ϑ, ι, Þ, δ, α, λ, γ are the coefficients to be estimated.

3.3 Data Types and Sources

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The time-series data was obtained from the Central Bank of Nigeria's statistics bulletin volume 29 and the World Development Index from 1981 to 2020.**4.0Data Analysis**

4.1.1 Unit Root Test.

The unit root test was carried out based on the augmented dickey fuller (ADF) test at a 5% level of significance.

TABLE 4.1.1 Result of Augmented Dickey-Fuller Unit Root Test

Variables	ADF Statistics	5% Critical Value	Order of Integration
LRGDP	-9.218325	-1.950394	I(1)
HDI	-4.830459	-1.950394	I(1)
POL	-5.762527	-1.950394	I(1)
LGEXP	-3.601119	-3.552973	I(1)
LPUD	-5.106364	-3.540328	I(1)

Source: Author's Computation, E-views version 9.0

Based on the above result of the Augmented Dickey-Fuller unit root test, all the variables are integrated of order 1(1) and are significant at a 5% level. This means that the null hypothesis will not be accepted. We, therefore, conclude that the time series collected are all stationary.

4.1.5 Co-integration Test

Co-integration is said to be existent between two or more variables if the Trace Statistic and Maximum Eigenvalue statistic indicates at least one co-integrating equation.

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Table 4.1.4: Johansen Co-integration Test on Model 3.7

Trace Statistic				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistics**	**0.05 Critical value**	**Probability value**
None *	0.467337	37.29453	29.79707	0.0057
At most 1	0.294638	14.61931	15.49471	0.0674
At most 2	0.055452	2.053742	3.841466	0.1518
Max-Eigen Statistic				
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen statistics**	**0.05 Critical value**	**Probability value**
None *	0.467337	22.67521	21.13162	0.0301
At most 1	0.294638	12.56557	14.2646	0.0912
At most 2	0.055452	2.053742	3.841466	0.1518

Source: Author's Computation, E-views version 9.0

Table 4.1.5: Johansen Co-integration Test on Model 3.8

Trace Statistic				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistics**	**0.05 Critical value**	**Probability value**
None	0.519419	29.27806	29.79707	0.0573
At most 1	0.07676	2.898686	15.49471	0.9713
At most 2	0.000653	0.023517	3.841466	0.878
Max-Eigen Statistic				
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen statistics**	**0.05 Critical value**	**Probability value**
None *	0.519419	26.37937	21.13162	0.0083
At most 1	0.07676	2.875169	14.2646	0.9547
At most 2	0.000653	0.023517	3.841466	0.878

Source: Author's Computation, E-views version 9.0

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Table 4.1.6: Johansen Co-integration Test on Model 3.9

Trace Statistic				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistics**	**0.05 Critical value**	**Probability value**
None	0.448329	28.16141	29.79707	0.0763
At most 1	0.123158	6.748464	15.49471	0.607
At most 2	0.054488	2.017042	3.841466	0.1555
Max-Eigen Statistic				
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen statistics**	**0.05 Critical value**	**Probability value**
None *	0.448329	21.41295	21.13162	0.0457
At most 1	0.123158	4.731422	14.2646	0.7753
At most 2	0.054488	2.017042	3.841466	0.1555

Source: Author's Computation, E-views version 9.0

The Trace statistic and Eigen Statistics indicate one co-integrating equation between economic growth (RGDP) and the independent variables, trace statistic, and Eigen Statistics also indicate one co-integrating equation between human development index, poverty level, and the independent variables. Thus, going by the Trace Statistic and Eigen statistics there is a long-run equilibrium relationship between real GDP, government expenditure, and public debt in Nigeria, there is a long-run relationship between HDI, government expenditure and public debt and also a long-run relation between poverty level, government expenditure and economic growth in Nigeria. Shocks can arise in the shortrun to prevent the variables from reaching a state of equilibrium in the long run. In other words, the variables possess the characteristics that would cause them to converge in the longrun. Interestingly, when only one co-integrating vector is established, its parameters can be interpreted as estimates of the long-run co-integrating relationship between the variables (Hallam and Zanoli, 1993).

4.1.6 Error Correction Mechanism

Given the fact that the variables are co-integrated, the next step is to estimate the long-run and short-run dynamics in the vector error correction model to capture the speed of adjustment to equilibrium in case of any shock that might arise in the independent variables. The error correction model estimation is carried out on the specified models to integrate their short-run dynamics with the long-run relationship.

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Table 4.1.8 Error Correction Estimates

Regressor	**Coefficient**	**Std Error**	**T-statistics**	**Probability**
C	952.623	1327.232	0.717752	0.4783
D (LRGDP (-1))	-0.04877	0.161298	-0.30237	0.7644
D (LGEXP (-1))	7.211529	3.689957	1.954367	0.0397
D (LPUD (-1))	-0.62016	0.928464	-0.66794	0.5091
ECM1(-1)	-0.71158	0.215605	-3.3004	0.0024
Regressor	**Coefficient**	**Std Error**	**T-statistics**	**Probability**
C	0.368822	0.01832	20.13239	0
D (HDI (-1))	18.10505	4.73111	3.826807	0.0006
D (LGEXP (-1))	2.27E-05	1.222071	1.85E-05	0.0509
D (PUD (-1))	1.92E-05	4.76E-06	4.046748	0.0003
ECM2(-1)	-16.106	4.797702	-3.35703	0.0021
Regressor	**Coefficient**	**Std Error**	**T-statistics**	**Probability**
C	-0.11231	0.74947	-0.14985	0.8819
D (POL (-1))	0.986301	0.486061	2.029171	0.0511
D (LGEXP (-1))	-0.000207	0.001821	-0.113626	0.9103
D (PUD (-1))	0.000136	0.000601	0.226939	0.822
ECM3(-1)	-1.39415	0.510235	-2.73237	0.0103

Source: Author's Computation, E-views version 9.0

Table 4.1.8 reveals that government expenditure exerts a positive and significant impact in the long run on the economic growth (LRGDP) and human development index (HDI) and is statistically significant as probability value is less than 0.05 while government expenditure exerts a negative and insignificant impact on the poverty level (POL). Public debt exerts a positive and significant impact on the human development index (HDI) while public debt has a negative and positive impact on RGDP and poverty level (POL) but is insignificant in Nigeria. On the other hand, the coefficients of the error correction term in the models 3.10, 3.11 and 3.12 are rightly signed and are -0.71, -16.11 and 1.39 and they are significant at 0.05. This sign indicates that the economic growth (RGDP), human development index (HDI) and poverty level (POL) will converge to its long-run equilibrium when there is a short-term relationship between the fiscal policy variables, this also means that the error will continue to be corrected in the long run at about 71%, 161% and 139% speed of adjustment respectively.

4.4 Discussion of Results

The analysis started by conducting a unit root test. The results of the analysis indicated that there is a long-run equilibrium relationship between economic performance and fiscal policy.Furthermore, it was found that fiscal policy represented by government total

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expenditure has a positive and significant impact on economic performance proxy economic growth (RGDP) and human development index (HDI) but has a negative and insignificant impact on poverty level in Nigeria. While on the other hand, the fiscal policy represented by public debts has a positive and significant impact on the human development index in Nigeria but exhibited an insignificant and positive impact on RGDP and poverty level. Fiscal policy is not fully effective on Nigeria's economic performance. The non-significance or partial effectiveness of the fiscal policy on the economic performance of Nigeria within the estimated periods could be attributed to several reasons. Firstly, public debt exerts a positive relationship with the poverty level in the longrun. The explanation for this was those loans obtained are not used for the development of the economy rather channel the funds to their benefit. For instance, Nigeria has borrowed large amounts, often at highly concessional interest rates with the hope to put them on a faster route to development through higher investment, faster growth and poverty reduction but in contrast economic growth and poverty situations are staggering at the back door amidst excess debt, albeit that was the initial intention. Public debt exerts a negative impact in the long run on economic growth (RGDP). This is not significant because there is a growing concern over the amount of borrowing indulged in, the servicing of foreign debt alone, and the future strain on poverty level and general sustainable development. Resources transferred abroad for debt servicing represents a reduction in what can be devoted to economic growth and development. This conforms to the finding of Obademi (2012).

Thirdly, poor information has limited the effectiveness of the fiscal policy on Nigeria's economic performance. Fiscal policy will suffer if the government has poor information. For example, if the government projected a recession, it will want to increase aggregate demand. However, if this projection is wrong and the growth of real GDP increases, government action would generate inflationary pressure. According to Obamanyi (2014), the factors responsible for public policy impact in Nigeria include lack of defined policy structure with no proper guidelines, ineffective targeting to real beneficiaries, deficiencies in the structure and content of the budget, lack of full implementation of budget, corruption, lack of continuity as different regimes, both military and civilians, enunciated different pattern of fiscal policy, poor governance, misappropriation of public funds and macroeconomic dislocation.

5.1 Summary of major findings

The study examined the impact of fiscal policy on the economic performance of Nigeria.The econometric techniques of the Augmented Dickey-Fuller test, Co-integration test, and Error Correction model estimations, with the findings of the study, revealed that the real GDP, human development index, poverty level, government expenditure, and public debts became stationary at the first-order difference. There was a long-run relationship between fiscal policy variables and economic performance in Nigeria. The speed of

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adjustment from the short run to the long run-on equations 3.10, 3.11 and 3.12 were 71%, 161%, and 139% respectively. Government total expenditure has a positive impact on economic performance proxy economic growth (RGDP) and human development index (HDI) but a negative impact on the poverty level in Nigeria. While on the other hand, the fiscal policy represented by public debts has a positive impact on the human development index and the poverty level but a negative impact on RGDP in Nigeria.

5.2 Conclusion

It was concluded that fiscal policy was partially effective on economic growth, human development index and poverty level (a proxy of economic performance) in Nigeria between 1981 and 2020. The partial effectiveness of the fiscal policy on Nigeria's economy could be attributed to lack of defined policy structure with no proper guidelines, ineffective targeting to real beneficiaries, deficiencies in the structure and content of the budget, lack of full implementation of budget, corruption, lack of continuity as different regimes, both military and civilians, different pattern of fiscal policy, poor governance, misappropriation of public funds and macroeconomic dislocation.

5.3 Recommendations

Based on the findings that have been established and the conclusion is drawn from the study, the following recommendations are necessary:

(i) Anti-corruption agencies like the Economic and Financial Crimes Commission (EFCC) and Independent Corrupt Practices Commission (ICPC) should be merged to avoid wastages in government expenditure and be strengthened to tackle the high incidence of corruption in the public sector. This will go a long way to ensure that public funds are expended on productive purposes.

(ii) The government has to put in place effective debt management strategies. This is to ensure that public debts are directed towards the purpose for which they are applied.

(iii) Government should come up with a monitoring team to supervise revenue generation and government expenditure in Nigeria.

(iv) Government should ensure that its debts are used to invest in critical infrastructure to provide the enabling investment environment and reduce external debt collections.

(v) There is a need for an improvement in government expenditure on health, education and economic services, as components of productive expenditure, to boost economic growth, human development index and reduce poverty level and in turn improve economic performance.

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Impact of Covid-19 Lockdown on Savings Mobilization in Nigeria

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Abstract

This study examines the impact of COVID-19 lockdown on savings mobilization by banks in Nigeria. An ordinary least square regression was applied to annual aggregate data to determine the type of relationship that exist, between the dependent and independent variable. Savings mobilization of the selected Bank was the independent variable, while the financial performance was the dependent variable. The financial performance of the four selected Banks is measured by some financial performance indicators; Profit after Tax (PAT). Multiple linear regression models and four hypotheses were specified the four selected Banks to ascertain the type of relationship that exist between the dependent and the independent variable. The findings show that savings mobilization of Banks during Covid-19 lockdown has a positive and significant impact on the dependent variables; Profit after Tax (PAT). In conclusion the study indicated that the savings mobilization of the selected Banks enhances their financial performance during the period under review which means that Covid-19 was of no significant impact on savings mobilization. A number of Policy recommendations were made based on the outcome of the research and prominent among them is the need for Banks to invest more on their outsourcing strategies to enhance their financial performance and savings mobilization.

Keywords: COVID-19, Savings Mobilization, financial Performance, Lockdown, Nigeria

1.1 Introduction

The Coronavirus pandemic that broke out in the city of Wuhan, China affected the macroeconomic outlook of Nigeria and indeed the whole world (World Bank, 2020). The coronavirus pandemic affects the world in a way that has not been seen since World War II (International Monetary Fund [IMF], 2020). The pandemic has led to loss of lives, and death tolls around the world are, in many cases, unacceptably high (WHO, 2020). In Nigeria, the government introduced a total lockdown of activities except for some business and offices that provides essentials goods and services. This action by the government has a serious implication on commercial bank activities.

Low savings, low income and lack of banking habit are characteristics of Africa (Magaji & Yahaya, 2012). The issue of domestic savings mobilization is an important issue in development across the globe. The baseline for this necessary concern is the traditional ISLM curve where the level of domestic savings is

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very instrumental in determining the level of investment in a nation. According to Magaji & Darma (2021), lower saving level may put a nation's economy in continuous low level of growth. Thus, nation needs to do something that will boost their level of savings to equivalently generate equal and opposite level of investment (Ekong &Mbobo, 2021).

One of the primary functions of the Commercial Banking System is the collection of all deposit taking and payment financial institutions in Nigeria. However, the function of commercial bank is classified into Micro and Macro functions. The micro functions are but not limited to Collection of deposit, Credit extensions, Receiving interest, Creation of medium of exchange, Issuing of cheque, Circulation of money; whereas in the macro functions, activities like, Capital formation role, Role in economic development, Transmission of money role, and role in industrial development may be considered (Okoroafor, Magaji & Eze, 2018 and Ekong & Mbobo, 2021).

The pandemic has caused different problems to the activities of financial institutions globally which include loan disbursement, recoupment of loan, physical meeting of clients, and reorganization of organizational structure and flow of activities (Dąbrowska, Koryński & Pytkowska, 2020). The performance of financial institutions that accept savings and rely heavily on deposits to make loans especially in Sub-Saharan Africa regions were extremely impacted (Igwe, Magaji & Darma, 2021 and Dąbrowska, et al., 2020). This paper however seeks to examine savings mobilization by banks during the lockdown period in some selected banks in Nigeria.

1.2 Research Questions

The research question for this study is as follows:

What is the impact of COVID-19 lockdown period on savings mobilization by banks?

1.3 Statement of Hypotheses

The following hypothesis is formulated to guide this study:

Ho1: COVID-19 lockdown period has no significant impact on savings mobilization by banks

2.0 Literature Review

2.1 COVID-19 and the Economy

The COVID-19 pandemic, like other pandemics in the past, do not only produce health shocks, but they also transmit economic shocks (Jackson et al., 2020). For instance, the IMF (2020) projects that every 10% decline in oil prices will, on the average, lower growth in oil-exporting countries by 0.6% and increase overall deficits by 0.8% of gross domestic product. For Nigeria, which is just recovering from a recession in 2016, the coronavirus pandemic effect on oil prices (the main source of revenue to the government) and lockdown on economic activities may completely wipe out the gains the country has recorded since coming out of recession in 2018. This will have impacts on the livelihood of households as well as performance of firms in Nigeria (Onuka, 2021).

The Financial sector has been greatly affected by the continuous rise of COVID-19. The pandemic which present sudden macroeconomic distress to financial system globally recently led to recession which has been experienced by different economy in the

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world. Important institutions which the pandemic affected are microfinance institutions and commercial banks. Microfinance institutions and commercial banks globally are faced with the difficulties of continually directing credit to small business and less privilege group of the economy despite falling economic activities while also managing rising risks (Financial Stability Board, 2020).

Thus, it is expected that the socio-economic harm induced by COVID-19 pandemic may influence the financial performance of commercial banks negatively. Foremost, the failure of small-scale businesses and less privilege household to repay debt caused by COVID-19 will lead to weakening of commercial banks performance. The pandemic will bring about cash strap to businesses due low cash flow to service debt collected as result of shutdown of machines, disruption in supply chain and unexpected decline in the demand for goods and services (Ogden & Bull, 2020).

2.2 Empirical Review

Most scholars have agreed that there is positive or negative relationship between bank saving mobilization and COVID-19 lock down period. However, scholars have differed on the direction of causality between bank savings mobilization and COVID-19 lock down period.

Ekong &Mbobo (2021) examine the effectiveness of monetary policy in enhancing the performance of the Nigerian Commercial Banks in terms of domestic savings mobilization for the period 1980 to 2019. The monetary policy variables used were, monetary policy rate, Treasury bill rate and money supply growth. Applying Autoregressive Distributed Lag Technique on the variables, we found that overall, monetary policy conduct was ineffective in enhancing commercial banks performance in domestic savings mobilization over the period. Our result shows that throughout the study, key variables of monetary policy were weak in driving domestic savings in Nigeria. Monetary policy rate variances only produces short term deposit impact that fades away over time. However, the economy's level of income showed evidence of accelerating domestic savings.

Dąbrowska, et al., (2020) analyse the effect of COVID-19 pandemic on the microfinance sector in Europe. The study based it analysis on data collected by Microfinance Centre (MFC) through a survey of microfinance institutions across Europe. The result of study shows that the epidemic affected all counties in Europe, however, the extent of the impact depends on the nature and strangeness of the country. Also, it was established that the lockdown imposed by countries to contain the pandemic influence microfinance banks and their clients negatively.

Okumoko & Akarara (2016) examine the impact of monetary policy on national savings mobilization drive and the possible transmission to investment in Nigeria from 1960 to 2016. The study used variables such as Monetary Policy Rate, Savings Rate, Total investment and Gross Domestic Product growth. Invoking Vector Autoregressive (VAR) technique on the variables obtained for the study, they found convincing evidence of strong impact of monetary policy on savings mobilization and by extension on investment in Nigeria in the period under review. Specifically, shocks such as increase in monetary policy rate increases both Savings and Investment in Nigeria in the short-run but

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not in the long-run. In the long run, monetary policy impact on savings and investment diminishes drastically.

OECD (2020) examines the consequences of the COVID-19 crisis on financing for sustainable development in low- and middle-income countries eligible for official development assistance (ODA). The current global context, however, risks a significant reduction in the financing available to developing economies. The result shows that external private finance inflows to developing economies drop by USD 700 billion in 2020 compared to 2019 levels, exceeding the immediate impact of the 2008 Global Financial Crisis by 60%. This exacerbates the risk of major development setbacks that would, in turn, increase vulnerability to future pandemics, climate change and other global public bads.

Ayeni & Adekunle (2021) investigate the effects of COVID-19 pandemic on the activities and performance of microfinance banks with special focus on South West Region of Nigeria. Data were collected from 100 heads of department selected from 20 randomly picked microfinance banks. Data were analyzed with simple percentage and regression technique. It was discovered that, COVID-19 impedes the activities of microfinance banks through fall in loans repayment, declining deposits mobilization, low customers patronage, poor operational efficiency, and high nonperforming loans. The study concludes that, COVID-19 imposed constraints on the activities of microfinance banks which negatively affect financial performance. They suggest that, there is need for quick response of regulatory authorities to microfinance banks. Financial and regulatory supports should be initiated to stop the declining activities of microfinance banks because microfinance banks play supporting role to small business and less privilege in the economy.

Hamzeh & Dania (2021) examine the effect of COVID-19 indicators and policy response on the Saudi banking index. COVID-19 variables that were applied are: new confirmed and fatal COVID-19 cases in Saudi Arabia; lockdowns; first and second decreases in interest rates; regulations, and oil prices. They implemented the analysis by running a stepwise regression analysis then building an artificial neural network (ANN) model. According to regression findings, oil prices and new confirmed cases have had a significant positive effect on the Saudi banking index. Nevertheless, the lockdown announcements in Saudi Arabia and the first decrease in interest rates had a significant negative effect on the Saudi banking index. To enhance the performance of the linear regression model, the ANN model was built. Findings show that the ranking of the variables in terms of their importance is: oil price, number of confirmed cases, lockdown announcements, decrease in interest rates, and regulations.

Barua & Barua (2020) in their study, COVID-19 implications for banks: evidence from an Emerging Economy, examine that the COVID-19 pandemic is damaging economies across the world, including financial markets and institutions in all possible dimensions. For banks in particular, the pandemic generates multifaceted crises, mostly through increases in default rates. This is likely to be worse in developing economies with poor financial market architecture. The study utilizes Bangladesh as a case study of an emerging economy and examines the possible impacts of the pandemic on the country's banking sector. Bangladesh's banking sector already has a high level of non-performing loans (NPLs)

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and the pandemic is likely to worsen the situation. Using a state-designed stress testing model, the study estimates the impacts of the COVID-19 pandemic on three particular dimensions—firm value, capital adequacy, and interest income under different NPL shock scenarios. Findings suggest that all banks are likely to see a fall in risk-weighted asset values, capital adequacy ratios, and interest income at the individual bank and sectoral levels. However, estimates show that larger banks are relatively more vulnerable. The decline in all three dimensions will increase disproportionately if NPL shocks become larger. Findings further show that a 10% NPL shock could force capital adequacy of all banks to go below the minimum BASEL III requirement, while a shock of 13% or more could turn it to zero or negative at the sectoral level. Findings call for immediate and innovative policy measures to prevent a large-scale and contagious banking crisis in Bangladesh.

3.0 METHODOLOGY

3.1 Model Specification

We used sample of four banks for the research. The data obtained was analyzed using a multiple linear regression model

$$PAT = \beta 0 + \beta 1OTSG + \beta 2OTSZ + \beta 3OTSA + \beta 4OTSU + U \text{¬¬¬¬¬¬¬-------(3.1)}$$

Where: Profit after Tax (PAT) is used as proxy to measure the Financial Performance of the selected banks

OTSG= saving mobilization of GTBank PLC

OTSZ= Saving mobilization of Zenith Bank PLC

OTSA= saving mobilization of Access Bank PLC

OTSU= savings mobilization s of UBA

Ut = Error Term

β0 = Intercept

β1, β2, β3, β4 = Slopes of the model

3.2 Method of Data Analysis

The technique used in estimating the parameters of the specified model is the Ordinary Least Squares (OLS) estimation method. The justification for choosing the OLS as the estimation technique was due to the desirable properties its estimate possess called the BLUE properties. These properties ensure good inference making, and efficient as well as non-misleading conclusion and recommendations.

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4.0 Results and Discussions

4.1 Result

Dependent Variable: PAT				
Method: Least Squares				
Date: 04/01/22 Time: 10:22				
Sample: 2020-2021				
Observations: 5				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	486167.9	932639.8	0.459242	0.6527
OTSG	2.369929	0.285607	9.291730	0.0000
OTSZ	0.266588	0.248578	1.068689	0.0039
OTSA	9.865943	1.060996	9.298595	0.0000
OTSU	-35787.88	43156.52	-0.828916	0.4169
R-squared	0.991904	Mean dependent var		7099970.
Adjusted R-squared	0.989897	S.D. dependent var		9064458.
S.E. of regression	914995.3	Akaike info criterion		30.48883
Sum squared resid	1.66E+13	Schwarz criterion		30.79416
Log likelihood	-390.4898	F-statistic		489.9608
Durbin-Watson stat	1.723047	Prob(F-statistic)		0.000000

Source: Author's E-view Results Output, 2022

The estimated regression model is:

PAT = 426167.9 + 2.369919OTSG + 0.265588OTSZ + 9.865743OTSA - 35767.88OTSU

S.E = (932039.8) (0.255607) (0.248518) (1.060995) (43150.52)

t = (0.457242) (9.271730) (1.068687) (9.298575) (-0.828910)

R^2 = 0.99 Adjusted R^2 = 0.98

F = 489.9008 D.W (d) = 1.72

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4.2 Discussion of Results

The coefficients of the explanatory variables; (OTSG), (OTSZ) and (OTSA) are positive indicating that there is a positive relationship between dependent variable (PAT) and the above independent variables. Furthermore, it implies that outsourcing strategies of GTBank, Zenith Bank and Access Bank impact positively on the financial performance of the three Banks during the period under review. On the other hand, the coefficient of the explanatory variable (OTSU) was negative; indicating that there was a negative or inverse relationship between the Dependent Variable (PAT) and the Independent Variable (OTSU). This suggest that outsourcing strategies of UBA does not impact positively on the financial performance of the bank within the period under review. The outsourcing strategies of UBA (OTSU) has a negative and insignificant impact on the dependent variable (PAT). This further implies that outsourcing strategies of UBA does not impact positively on the financial performance of the Bank during the period under review. These findings is in line with the previous studies conducted by Ibrahim and Isiaka (2019) that found a positive relationship between outsourcing and financial performance of banks as well as that of Uzoamaka & Onwuchekwa, (2018) that founds a negative relationship between the two variables. Coefficient of Determination: This shows that about 99% of total variations in the dependent variable (PAT) were explained by the changes in explanatory variables of the estimated model. This implies that the estimated model has a good fit. Similarly, the adjusted coefficient of determination (R^2) also shows that the estimated model has a good fit (that is, Adjusted $R^2 = 0.98$). This suggests that 98% of the total change in the dependent can be attributed to the Independent variables.

5.0 Conclusion and Recommendations

This study examines the impact of Covid-19 lockdown on savings Mobilization by selected banks in Nigeria. We however, found that Covid-19 lockdown has no significant impact on savings mobilization during the period (perhaps the impact may be in bank lending). This may be due to increase in transfers from abroad by Nigerians during the period and reduced luxury consumptions. We therefore recommend further research on the impact of Covid-19 on bank lending.

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Trader-Moni and Economic Development of Petty Traders in Owerri, Nigeria

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Abstract

The trader-monias a loan scheme with no collateral, aimed at equipping petty traders with soft loans to enable them grow their businesses and increase earnings. In spite of the execution and implementation of the scheme, petty traders may not have been able to expand their businesses to a reasonable extent or, increased their earnings. Thus, this study investigated if trader-moni has led to the economic development of petty traders in Owerri especially as petty traders could not access the subsequent trenches of loans which the scheme provided for petty traders. The study proposed three research questions that investigated the level of improvement or otherwise of the businesses of the petty traders that partook in trader-moni scheme. The study anchored its theoretical framework on the rational theory of Adam Smith because it best explains the implementation of the trader-moni in Nigeria. The data used for this study was collected through in-depth interview and other secondary sources of data collection techniques. The interviewees of this study were those petty traders who benefitted from the scheme in Owerri. Findings revealed that those who benefitted from the trader-moni scheme could only access the first trench of N10, 000 (Ten Thousand Naira) that was disbursed and with little or no paybacks made. The scheme was able to impact minimally on the growth of the businesses of the participants due to the political undertone of its implementation. Therefore, the study recommends that development programmes like trader-moni should not be implement few months to the electioneering period. It was also recommended that the government be transparent in their dealings with citizens.

Key words: Loan,Petty Traders, Trader-Moni & Nigeria

1.0 Introduction

Petty traders are major contributors to the economic development in Nigeria in terms of employment and income generation especially, as they contribute immensely to the growth of the informal sector. Over time, petty traders have encountered various challenges in the aspect of acquiring capital and loans for the smooth running and sustenance of their business. Even when these traders seem to have been privileged to have access to loans, most of them may not have taken advantage of these loan opportunities due to lack of collateral or financial documents that enable access to such loans.

In view of this, the President Muhammadu Buhari's administration implemented a social intervention programme that was aimed at providing loan for petty business people, and artisans; basically those within the informal sector with ease and with no collateral. This

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programme, known as trader-moni disbursed N10, 000 (Ten Thousand Naira) on its first phase and access to subsequent phases ofN15, 000 (Fifteen Thousand Naira), N20, 000 (Twenty Thousand Naira),N50, 000 (Fifty Thousand Naira) and N100, 000 (One Hundred Thousand Naira) were dependent on the payback of the loan at each stage (Onyishi& Ogbu, 2019).

Aderonmu(2018) added that the repayment plan for this loan is for six months and beneficiaries can only qualify for a bigger loanwhen they repay the loans at each stage and within the stipulated time. According to him, this was aimed at reducing the financial challenge encountered by petty traders so they could improve their business and thus, increase their earnings. As laudable and well thought out the scheme appears to be, beneficiaries may not have been able to improve their business and earnings due to the prevailing circumstances of the execution of the scheme.

This government intervention that was aimed at assisting petty traders financially by providing collateral free and easily accessible loans may have ended in futility due to the fact that it was implemented few months to the 2019 general election.

The masses may have assumed that trader-moniwas a new form of vote buying by the APC administration. They may have concluded that it was “election money” or “free money” and squandered it instead of investing it in their business. Asides this, beneficiaries of the scheme who may have wanted to access subsequent trenches of funds provided to grow their business may not have been well sensitised on how to access these loans. Thus, limiting them to the first trench ofN10, 000 (ten thousand Naira)which they may not have paid back out of ignorance. This may have ultimately affected the number of beneficiaries to this scheme and impeded on government’s attempt to reach out to as many beneficiaries as possible.

In view of this, this study investigated trader-moni and the extent to which it was able to improve the business and earnings of petty traders. It also, tried to answer the following questions. They are:

1. To what extent has beneficiaries of trader-moni improved their business and increased their earnings using the trader-moni?
2. What challenges were faced by government in the implementation of the trader-moni scheme?
3. How can subsequent interventionist programmes be implemented to improve the economic development of petty traders in Owerri?

An overview of trader-moni

Trader-Moni is a loan program of the Federal Government of Nigeria (FGN), created specifically for petty traders and artisans across Nigeria. It is a part of the Government Enterprise and Empowerment Program (GEEP) scheme of the Federal Government, being executed by the Bank Of Industry (BOI)(Ogbette, Bernard-Oyoyo& Okoh, 2019).

With TraderMoni, beneficiaries receive interest-free loans starting from N10,000 (Ten Thousand Naira) which grows all the way to N100, 000 (One Hundred Thousand Naira) as they pay back. On the first loan, beneficiaries get a loan of N10, 000 (Ten Thousand Naira) as the first loan. When they pay back the first loan, they immediately qualify for a second loan of N 15,000 (Fifteen Thousand Naira). After they payback of the second loan, they qualify for N 20,000

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(Twenty Thousand Naira) loan, and then N 50,000 (Fifty Thousand Naira), and then N100,000 (One Hundred Thousand Naira), (Trader-Moni, 2019).

This programme centred on providing no interest loans for the petty traders to enable them finance, run their business smoothly and improve on their business. This loan was disbursed within 48 hours without any collateral by the Bank of Industry (BOI), being a bank with the structures and processes to reach out to applicants. Beneficiaries of this scheme included small kiosk owner, food stuff seller, bread seller, wheel barrow pusher, mobile tailor, mobile cobbler, fruits seller andtricycle (*keke*) riders.Some of these beneficiaries have no bank accounts and are usually not attractive or profitable to traditional lenders. They find it hard to access loans to trade, and they therefore remain in a cycle of poverty. This necessitated a loan system that would not just reduce the stress of getting financial assistance to improve the various businesses, but also, improve the living conditions and standards of these petty traders, artisans, food vendors, farmers, transport owners and so on (TraderMoni, 2019).

The basic requirements for accessing Trader-Moni loan scheme 2018/2019 were as follows;

1. Being acitizen of Nigeria.
2. Attaining the age of 18 (Eighteen) years and above.
3. Owning and operating a viable business.
4. Registering with a market cooperative union within your area of operation.
5. Possessing a valid means of identification.
6. Ownership of a SIM/phone number that is properly registered with a telecommunications service providers within the country.

Spark gist (2018) added that for one to be a beneficiary of the 2018/2019 Federal Government Trader-Moni Scheme, an online loan application process has to be undergone for the ease and convenience of BOI's prospective small medium enterprise customers. This is because, that they do not initially have to come physically to the Bank to submit their loan applications. It also has the advantage of shortening the loan processing Turn-Around-Time (TAT) of the Bank. The portal has document uploading capability as well as allows the loan applicant select the preferred BOI state office location where the application will be processed. The online loan application portal was accessed on the Bank's website; www.boi.ng/apply or anyTrader-Moni stand within the market.

This process makes for convenience and easy accessibility of agents or the loans itself. The age and nationality restriction may be to ensure that those who benefit from the programme are Nigerian adults who are capable of making logical decisions as it affects their business.

Impact of trader-moni on petty traders.

Trader-moni scheme wasdesigned to help petty traders expand their trade through the provision of collateral free loans of an initial sum of N10, 000 (Ten Thousand Naira). The scheme was launched in partnership with the Bank of Industry, BOI, in order to enlarge government's financial inclusion agenda down to the grassroots due to the contribution of petty traders to economic development of any nation. It is a federal government empowerment scheme to help alleviate poverty in Nigeria by empowering traders and artisans.

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Trader-moni is similar to MarketMoni which is another cash transfer loan scheme of the Federal Government under the same Social Investment Programs, but they are not the same. While Market-moni loans start at N50, 000 (Fifty Thousand Naira) and target medium-scale traders, market women, artisans, and youth in market associations, Trader-moni loans on the other hand starts at N10, 000 (Ten Thousand Naira) and target petty traders and petty artisans. There has been lots of misconceptions with people questioning what the petty traders can do with N10, 000 (Ten Thousand Naira). However, one cannot wish away the impact such loans could have on an average food vendorwho sells on the street and started with an initial capital ofN 30,000 (Thirty Thousand Naira).

As little as it may seem, an added sum of N 10,000 (Ten Thousand Naira) to such business venture would likely improve on the business and earnings (Adekunle, 2018).An average income earner may not realise the impact the sum ofN10, 000 (Ten Thousand Naira) would do on a business, but, the rural traders, considers it to be a leap on her business. The sum is capable of making a significant impact on the business of the roadside corn seller, *akara* / bean-cake seller, the *Ugu* (Pumpkin) seller as well as the groundnut, garri, shoe maker/ repairer, beans and all other petty traders who are the beneficiaries of this scheme.

These loans come from recognition of the genuine contribution of petty traders to the growth of the nation's economy.

Consequently, the loan was designed not only to help local traders to expand their businesses, but also change their standards of living. It plays a key role in aiding poverty alleviation and stability in the country's economic outlook(Adekunle, 2018).Adekunle further added that this program aims at reducing short term poverty by direct cash transfers and fight long-term poverty by increasing human capital among the poor through conditional cash transfers andaccess to credit to help petty traders boost the output of their petty businesses.Therefore, the impact of trader-moni loans was not pronounced in average income earner. It was more pronounced on low income earners who relied on little capital to improve their businesses and increase their earnings.

Criticisms of Trader-Moni

The former president of Nigeria, former president Obasanjo asserts that there is a sinister motive behind the trader-moni. According to him, the program can only be construed to be very shallow and lopsided, if not an out rightly idiotic program. Obasanjo went further to ask "what is the connection between taking the number of PVC (Permanent Voters Card) of the recipient of the N10, 000 doled out to 'traders' and the forthcoming election"? (Nasir, 2019).

Also, the past governor of Ekiti State, Mr. Ayodele Fayose has described the Federal Government Trader-Moni scheme as not only an avenue for advanced votes buying but direct re-looting of the Abacha loots. Fayose questioned the rationale in Vice President, Prof. YemiOsinbajo leaving Abuja and spending about N25 million on maintenance of presidential jet as well as allowances for himself, aides, protocols, security and others just to share N10 million.

According to him, if the Federal Government was sincere about Trader-Moni, the fund should have been paid into bank accounts of beneficiaries so that the disbursement can be traced and properly audited. He added that when he was governor, more than 20,000 people got N5, 000 monthly stipends and the

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money was paid into their bank accounts (Ojomoyela, 2019).

The Social Democratic Party in Oyo State also condemned the Trader-Moni scheme of the ruling All Progressives Congress, describing it as a ploy to hood wick voters into another four years of suffering. In furtherance to this claim,the former Senate President Bukola Saraki stated that the present government has been using the program to induce voters ahead of the 2019 presidential election. He accused the government of side-lining the opposition from the launching of the program across the country and making it appear like it's not a program for all Nigerians but for supporters and members of the ruling All Progressives Congress (APC) (Toromade, 2018).

Furthermore, the former Speaker of the House of Representatives Rt. Hon Yakubu Dogara condemned the distribution of cash to the public very close to general elections by public officials. The lawmaker said no matter how noble the intent maybe, such endeavour amounts to vote buying and inducement, which is a clear case of corruption; inducing the public with cash in exchange for their votes was a fraud (Nwachukwu, 2018).

It is no gainsay that the trader-moni may have had some political undertone based on its criticisms. But it is worthy to mention that beneficiaries of the scheme may have improved their business and earnings through the scheme. This is because the scheme enabled them to acquire loans with little interest, with ease and with no collateral or financial documents.

Theoretical Framework

This study anchored on the rational choice theory that was propounded by Adams Smith because, it best explains intention and motive. This theory postulates that individuals rely on rational calculations to make rational choices that result in outcomes aligned with their own best interests.

Based on this theory, the president Buhari's administration arrived at the decision of giving trader-moni to those in the informal sector because it believed that trader-moni would improve the economic condition of petty traders by giving them access to the capital needed to fund their businesses.

This decision may have been prompted by the need to win the 2019 election. The administration may have believed that trader-moni was going to make the masses see them in good light and make them believe that they are visionary economically and vote them into power.

Methodology

The study focused on assessing the level of impact the trader-moni scheme had on the businesses and earnings of petty traders in Owerri. Data was derived from unstructured settings where petty traders do their business like shops that are along the road, verandas, streets etc. The researcher adopted a descriptive research design to effectively analyse the research finding in a comprehensive manner.

Data was collected through secondary sources of data collection techniques like the use of internet materials, journals, text books and in-depth interview. The researcher picked purposively picked 10 (Ten) interviewees who are petty traders for the study because the trader-moni did not benefit all petty traders in Owerri. These interviewees comprised of business people who engage in business before, during and after the trader-moni initiative. The data derived from this study was analysed using a sociological discuss analysis so as to ensure better comprehension.

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Research Findings

Beneficiaries Access to the Trader-Moni Scheme

All the interviewees asserted that they benefitted from the N10, 000 (Ten Thousand Naira) given to petty traders as trader-moni but did not benefit from subsequent loans. While 40% (Forty Percent) stated that they did not know it was a loan, 60% (Sixty Percent) stated that it was election money that was used for campaign as the loan did not state how they were going to pay back. They further stated that, the agents who gave them the trader-moni did not return to take back the loan till date.

Impact of the Trader-Moni Loan on Businesses

40% (Forty Percent) of the trader-moni beneficiaries stated that the trader-moni to an extent helped them in the conduct of their business while 60% (Sixty Percent) said the money was not enough to grow their business or significantly increase their earnings or profit. 30%(Thirty Percent) stated that they would have preferred it if the trader-moni was a huge sum of money as it would have made significant impact on their business while another 30% (Thirty Percent) were of the opinion that the money did not have any impact on the business or earnings.

Did you pay back the loan?

All the beneficiaries that were interviewed stated that they did not pay back the loan. 30% (Thirty Percent) had the mindset that it was not a loan but their share of the nation's cake. 20% (Twenty Percent) said they did not know how to pay back the loan while 50% (Fifty Percent) of the population said they wouldn't have paid even if they knew they were meant to pay back.

Ease of Access to the Trader-Moni

All the beneficiaries said the process of getting the loan was very easy as agents went round to register them.10% (Ten Percent) of the population stated that agents demanded a service charge of N1000 (One Thousand Naira) for them to be registered.

Proximity of Trader-Moni Stands to Local Businesses

All the beneficiaries stated that there were no trader-moni stands around their places of business. 60% (Sixty Percent) stated that they were unable to notice any even if there were. All the beneficiaries affirmed that the trader-moni agent located them in their place of business and they did not go looking for them.

Discussion of research findings

The findings of this study revealed that all the interviewed beneficiaries of the scheme were able to access the initial sum of N10, 000 (Ten Thousand Naira) that was given to traders but did not benefit from subsequent loans as stated by trader-moni 2019. This may be because they did not pay back the first loan. The study further also revealed that the non-payment was as a result of the unwillingness of some to pay back and the lack of sensitisation of how to be paid back. According to spark gist (2018), the trader-moni loan could be accessed through the bank website and any trader-moni stand within the market. But beneficiaries asserted that this wasn't the case as they did not see the trader-moni stand anywhere around the place of business.

Though, they affirmed that the loan was easy to access and that it helped to an extent, the growth of their business. Most of the interviewees assert that due to the small amount that was loaned to them, the trader-moni did not make significant impact in the growth of their business.

Conclusion

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Trader-moni was a loan scheme that was aimed at providing loans for petty traders without collateral. But due to the time it was implemented, it developed a mixed feeling as to if the trader-moni was actually aimed at vote buying or providing loans for petty traders as presumed. These feelings heightened when the scheme came to a halt immediately after the 2019 election.

This may have militated against the success the programme would have had if the masses had trusted the government's motive of introducing the scheme and paid back the loan. Nevertheless, the trader-moni was able to provide economic relief for petty traders though not to a large extent but, to a small extent.

Recommendation

Timing for the implementation of programmes: the impact of programme implementation cannot be over emphasized but when these programmes are implemented few months to elections, the public may assume it was meant to instigate them into favouring a particular party with their vote. Thus, it is recommended that such schemes should not be implemented close to the time of election and stopped immediately after the election period is over.

Transparency: the government should be transparent in her dealings with citizens so that citizens can trust them. In the implementation of such programmes, there should be proper documentation of beneficiaries of the scheme so as to keep a tab on the use of such loans and to encourage them to take advantage of other available loan facilities. This will enable the government achieve its objective of empowering petty traders.

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Exploring the Utilization of Cowpea Storage Mechanisms for Post-Harvest Loss Avoidance in Kuje Area Council, Abuja

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Abstract

The study was carried out to explore the utilization of Cowpea storage mechanisms for post–harvest loss avoidance by Cowpea Farmers in Kuje Area Council, Abuja. Purposive stage sampling technique was employed in sampling the 100 respondents used for the study. Primary data were used for the study and they were collected using well-structured questionnaires, and they were analysed using descriptive statistics. The result shows that majority (59%) of the cowpea farmers are male, while 42.2% within the age bracket of 36 and 45. Most (89.2%) of the cowpea farmers were married while 28.9% of the respondents had a household size between 6 and 10 persons, and this means that most of the farmers will likely to have access to family labour. The most widely utilized storage mechanism by cowpea farmers in the study area are Pirimiphos-methyl and Alluminium phosphate while the least widely used technology is crib. However, the PCI of the constraints the farmers face in the usage of cowpea storage technologies shows that inadequate capital, poor attitude of extension agents, unreliability of innovations, and inadequate extension services were the most prevalent challenges faced by the respondents in the study area. It was recommended that financial institutions should ensure that the process of acquiring agricultural loans and credits are simplified so that the farmers can easily have access to capitals for their agricultural activities, while also recommending the government and private organization involved in extension service delivery ensure that farmers are effectively equipped with the right information on available mechanism and their utilization.

Keywords: Cowpea, storage, mechanism, farmers

Introduction

Cowpea (*Vigna unguiculata*) is a native legume to sub-Saharan Africa and it is mostly grown in the dry savanna region as an intercrop with crops like sorghum, maize, millet, and groundnut. Cowpea is an important source of protein, and it is consumed in different forms in various parts of the tropics. It plays a major role in begetting income and ensuring food security for many small-scale producers (Abadassi, 2015). Nigeria is the both largest producer and consumer of cowpea in the world, accounting for about 45 percent of the world's cowpea production. Despite the large production of cowpea in the country, there is still a challenge of postharvest losses.

One of the major challenges of cowpea production is insect pests and disease invasion which results in enormous economic

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losses. The major storage problem in cowpea (*Vigna unguiculata*) storage around the world is pest's invasion. It has been guessed that about 4 percent of total annual production of cowpea or about 30,000 tonnes in Nigeria are lost annually (Fakayode*et al.,* 2014). *Callosobruchus maculatus* (beans weevil) is the most important storage pest of cowpea and severe infestation from weevils can lead to total grain loss in storage. Although, the grains initially protected from insects inside the harvested pods, the grains are exposed to post-harvest insect pests following the threshing of the grains, and become more vulnerable to these insects during storage (Murdock *et al.,* 2003). As stated by Murdock *et al.* (2012), Insect pests mutilate on cowpea can lead to as high as 80 to 100% loss if not properly managed.

In Nigeria, consumers abstain from damaged grain, especially cowpea, and this is further worsened by the simple fact that the storage of cowpea in Nigeria is mostly carried out by resource-poor small-scale farmers who have little or no access to knowledge and resources to acquire the relevant storage facilities and even chemicals to control pests (Murdock *et al.,* 2012). However, Ebuehi and Ojewole discovered that most Nigerians prefer to consume brown cowpea brands as compared to local white varieties (Sennuga*et al.,* 2021). The reason is that most Nigerian cowpea processors lack adequate technology of cowpea processing to meet international standard. The main goal of storage is to effectively manage the fluctuations in market demands and supply, within different seasons, by taking the produce off the market in when supplies are high, and introducing it back into the market in scarce seasons, when demands are high and supplies are low. This also ensures that fluctuations in market prices are checked out. But if the crops are stored without efficient storage techniques, they could become susceptible to insect pests, which pose a major threat to the shelf-life of stored grains. These insects reproduce rapidly, thus within a month, a few number of the insects can cause significant damage to large quantity of cowpeas. Hence, the need to explore the utilization of cowpea storage mechanism to avoid post-harvest losses among farmers in Kuje Area Council of Abuja Nigeria. Therefore, the purpose of the study is to explore the utilization of Cowpea storage mechanisms for post–harvest loss avoidance by Cowpea Farmers in Kuje Area Council, Abuja, Nigeria.

The Specific objectives of this study are to:

i. describe the socio-economic characteristics of cowpea farmers utilizing cowpea storage mechanisms in study area.

ii. explore cowpea storage mechanisms utilized by cowpea farmers.

iii. identify the constraints in the utilization of cowpea storage mechanisms by cowpea farmers.

Methodology

Materials and Methods

Study Area

This study was conducted in Kuje Area Council of the Federal Capital Territory, Abuja. The area council is located at the North Central region of the FCT and lies between 80^{o} – 90^{o} East and 70^{o} North. On the North-east of the territory, it is bordered by the Municipal Area Council and to the west by Gwagwalada Area Council. Kuje has a total land area of 1,800sq km, which translates to about 23% of the Federal Capital Territory. The native people of the area

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council includes: Bassa, Hausa, Fulani, Gude and Gbagyi (who are believed to be the first settlers in the locality. The weather in the area council is typified by alternate wet and dry seasons with a mean annual rainfall ranging between 1000mm and 1500mm. The wet season starts from April to October while the dry season, which is usually accompanied with harmattan, is between October and March (Ekpetere & Faith, 2019).

Sampling Technique

Purposive sampling technique was used to select four (4) communities (Gawu, Pesali, Kwaku and Gadoro) who are the major cowpea farming communities in the study area. 25 respondents were randomly selected from each of the communities. This gave us a total 100 respondents used for the study.

Data Collection

Primary data was used for the study. These were collected using well-structured questionnaires. The questionnaires were administered with the help of well-trained enumerators who are familiar with the study area.

Data Analysis

Descriptive statistics was used to actualize the objectives of the study. Frequency and percentage were used to achieve objectives 1, which is to describe the socio economic characteristics of the respondent; and objective 2, which is to explore the utilization of cowpea storage mechanisms used by cowpea farmers; while objective 3, which is to discover the constraints in the utilization of cowpea storage mechanisms by cowpea farmers, was actualized using a problem confrontation index.

Problem Confrontation Index

With limited variation in factors, a problem confrontation index based on the Likert scale was utilized to discover the constraints in the utilization of cowpea storage mechanisms by cowpea farmers, was actualized using a problem confrontation index.

The Problem Confrontation Index is stated thus

$$\boldsymbol{PCI} = \boldsymbol{P_n L_0 + P_l L_1 + P_m L_2 + P_h L_3} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (\mathbf{1})$$

PCI= Problem Confrontation Index (Units)

P_n = The Frequency of farmers that say they haven't had any issues (Units)

P_l= Farmers who evaluated the challenges as minor in number (Units)

P_m= Farmers who evaluated the difficulties as moderate in frequency (Units)

P_h = The Frequency of farmers who evaluated the situation as severe. (Units)

Results and Discussion

Socioeconomic Characteristics of Respondents

Presented in Table 1 is the result of the socio economic characteristics of the cowpea farmers in the study area. The result shows that most (59%) of the respondents were male, which implies that males are more involved in cowpea farming that the females. However, from the result, 41% of the respondents were female, which means that a reasonable number of women are involved in cowpea production in the study area. The result for the age of the respondents shows that majority (42.2%) of the respondents were between the ages of 36 and 45 years old, while 27.7% of the respondent were between the ages of 20 and 35 years old. This means that most of the respondents are gainfully active person, and they possess the plasticity

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to cope with the physical demands of agriculture. This is in line with the findings of Chikezie *et al.* (2012). The result shows that 89.2% of the respondents were married while the remaining 10.8% were single. Table 1 further reveals that majority (37.7%) of the respondents had a household size of between 6-10 people, 28.9% of the respondents had a household size between 1 and 5 while 27.7% of the respondents had a household size between 11 and 15 people. Farmers with large household size are likely to take advantage of their household size to utilize family labour to effectively participate in production and post-harvest activities, and this aligns with Tambo & Abdoulaye (2013).

Table 1 shows that most (53%) of the respondents had secondary school education while 47% of them had primary school education. This is in line with the findings of Idu*et al.* (2020) which found that most of the respondents in their study had formal education. The result further shows that the major occupation among the respondents was farming according 74% of the respondents. The result for years of farming experience shows that 28.9% of the respondents had a farming experience of between 16-20 years while 26.5% had a farming experience of 6-10 years. According to Dossah& Mohammed (2016) the more a person does a particular job frequently, the better the get at it. In that same vein, the more years of experience a farmer has, the better they are at making important decision to better their enterprise. The result for farm size of respondents reveals that 39.8% of the respondents had between 11 to 15 hectares of farmland. Also, 22.9% of the respondents had between 6 to 10 hectares of farmland while 19.3% of the cowpea farmers had between 1 to 5 hectares of farmland. The annual income of the respondents as presented in Table shows that 41% of the farmers had an annual income between N201000 and N401000. Still in Table 1, the result reveals that most (75.9%) of the respondents were members of cooperative societies. Membership of cooperative societies affords the farmers access to information, credits, inputs, and the opportunity to have savings. Akpan (2010) stated that membership of cooperative societies helps in enhancing the level of participation in agricultural activities because it affords them the opportunity to enjoy privileges available to group members.

Table 1: Distribution of Respondents by their Socio-Economic Characteristics (N = 100)

Variable	Frequency	Percent (%)
Gender		
Male	49	59
Female	34	41
Age (years)		
20-35	23	27.7
36-45	35	42.2
46-55	17	20.5
56-65	8	9.6
Marital Status		
Single	9	10.8
Married	74	89.2
Household Size		

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1-5	24	28.9
6-10	28	33.7
11-15	23	27.7
16-20	5	6.0
21 and above	3	3.6
Level of Education		
No formal education		
Primary education	39	47.0
Secondary education	44	53.0
Tertiary education		
Years of Experience		
1-5	15	18.1
6-10	22	26.5
11-15	8	9.6
16-20	24	28.9
21-25	6	7.2
26 and above	8	9.6
Farm Size		
1-5	16	19.3
6-10	19	22.9
11-15	33	39.8
16-20	14	16.9
21 and above	1	1.2
Annual Income (N)		
100000 and below	3	3.6
101000-200000	7	8.4
201000-300000	17	20.5
301000-400000	17	20.5
401000-500000	34	41.0
501000-600000	5	6.0
Cooperative Society		
Yes	63	75.9
No	20	24.1

Storage Mechanisms Used by Cowpea Farmers in the Study Area

Table 2 shows the storage mechanisms utilized by cowpea farmers in the study area. From the result, we see that most (24%) of the respondents make use of Pirimiphos-methyl to store their cowpea in the study area. This is in line with the findings of Anku-Tsede (2000) who noticed a significant increase in the perception and use of Pirimiphos-methyl among cowpea farmers in Volta region of Ghana. Also, alluminium phosphate (22%), 17% of the cowpea farmers in the study area make use of containers for storing cowpea which agrees with the discovery of Osei-Boahen (2016) who opine that, the farmers tend to use empty containers as storage utensils for their cowpea. The result further shows that (15%) of the respondents use hermetic sacks mechanism

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to store cowpea in the study area. While (14%) of respondents make use of storage bags for cowpea storage and (8%) of the respondents used cribs. This confirms with Fakayode*et al.* (2018) who endorse that the use of crib mechanism to store cowpea is a widely adopted practice in Kwara State. The pictorial representation of the storage mechanisms used by the farmers is presented in table 2. It shows that the most widely used cowpea storage mechanisms are Pirimiphos-methyl and Alluminium phosphate while the least widely used mechanism is crib. Based on the findings in the study area.

Table 2: Storage Mechanisms Used by Cowpea Farmers in the Study Area

Storage Technology	**Percent (%)**
Pirimiphos-methyl	24
Alluminium phosphate	22
Containers	17
Hermetic sacks	15
Crib	8
Storage bags	14

Field data analysis, 2021

*Multiple responses allowed

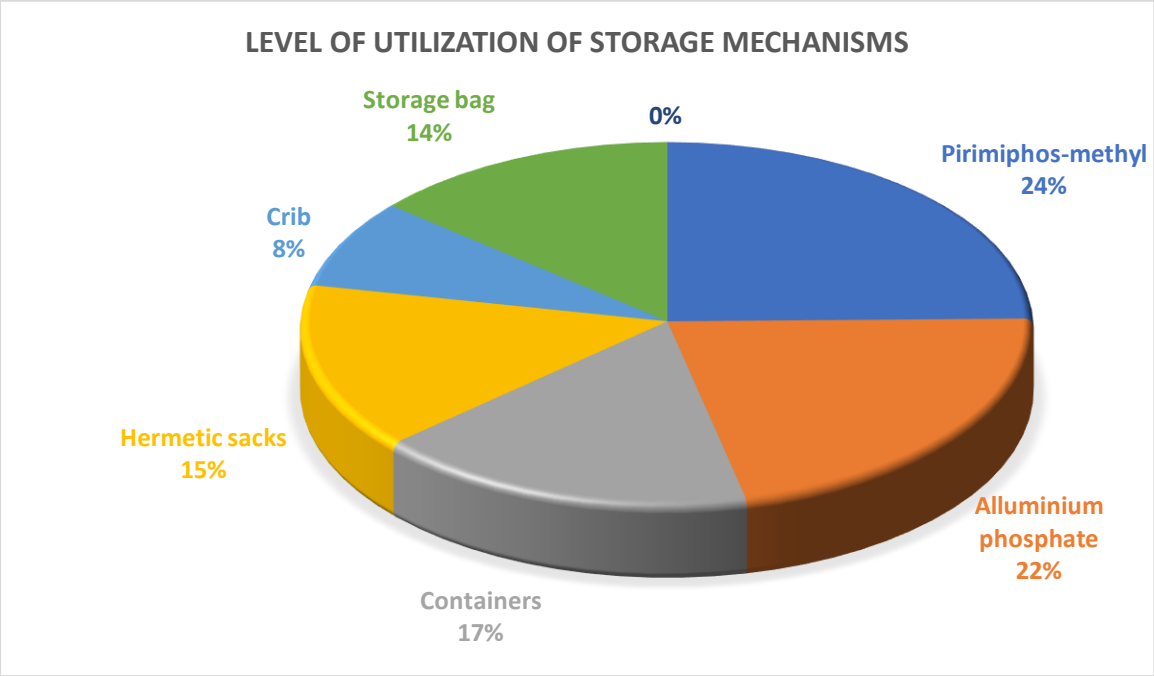

Fig 1: Level of utilization of cowpea storage mechanisms

Constraints in the Utilization of Cowpea Storage Mechanisms by Cowpea Farmers

Table 3 shows the result for the problem confrontation index for the respondents. The result shows that "inadequate capital" got the highest score (PCI-286) and was therefore considered as the 1st ranked problem. Capital is important in production, as it makes it easier to acquire and control other factors of production. Capital can be in different forms but the most common form of capital is money. Availability of fund ensures that the farmers are able to access the available mechanisms and practices. This finding agrees with the claim of Owach*et al.* (2017) who found out that, access to capital is one of the factors that affect cowpea utilization storage by cowpea farmers. The result shows that "Poor attitude of extension agents" got the 2nd highest scores (PCI-284) which was considered as the 2nd ranked problem. Also, "Unreliability of the innovation" got the 3rd highest scores (PCI-279) and hence it was considered as the 3rd ranked problem. This aligns with Abebe *et al.* (2013) who postulate that farmers tend to be conservative about adopting new innovations because of their perceived unreliability of new technologies. Inadequate extension services, with a PCI of 278, ranked 4th and this implied that it was the 4th most severe problem faced by the farmers in the use of cowpea storage technologies in the study area. Extension services help to create awareness for the farmers on available technologies. If these services are lacking or not efficient, then the farmers may be struggling to store their beans grains using old methods because they are unaware of the availability of new technologies. This is in line with the findings of Alene and Manyong (2006) who confirm that one of the challenges to the usage of improved cowpea storage mechanism was the lack of quality

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extension services. The result shows that "Delay in distribution of subsidized farm inputs" (PCI-265), "Inadequate processing and storage facilities" (PCI-239), and "High cost of agro chemicals" (PCI-218) are the 5th, 6th and 7th ranked problem faced by the respondents in the use of cowpea storage technologies in the study area. Meanwhile the result shows that "Inaccessibility of technology" with a PCI of 175 is the least serious challenge faced by the respondents in the use of cowpea storage technologies in the study area.

Table 3: Constraints in the Utilization of Cowpea Storage Mechanism by Cowpea Farmers in the Study Area

	Extent of problem confrontation					**Rank**
Constraint	**Not a problem**	**Fairly serious**	**Serious**	**Very serious**	**PCI**	**Order**
Inadequate capital	6	34	66	180	286	1
Poor attitude of extension agents introducing technology	6	18	120	140	284	2
Unreliability of the innovation	4	28	123	124	279	3
Inadequate extension services	12	30	48	188	278	4
Delay in distribution of subsidised farm inputs	9	36	96	124	265	5
Inadequate processing and storage facilities	11	56	96	76	239	6
High cost of agro chemicals	16	66	84	52	218	7
Poor market price of cowpea	11	88	75	40	214	8
Low level of education	23	76	72	20	191	9
Complexity of the technology	30	64	66	24	184	10
Inaccessibility of technology	35	66	42	32	175	11

Field data analysis, 2021

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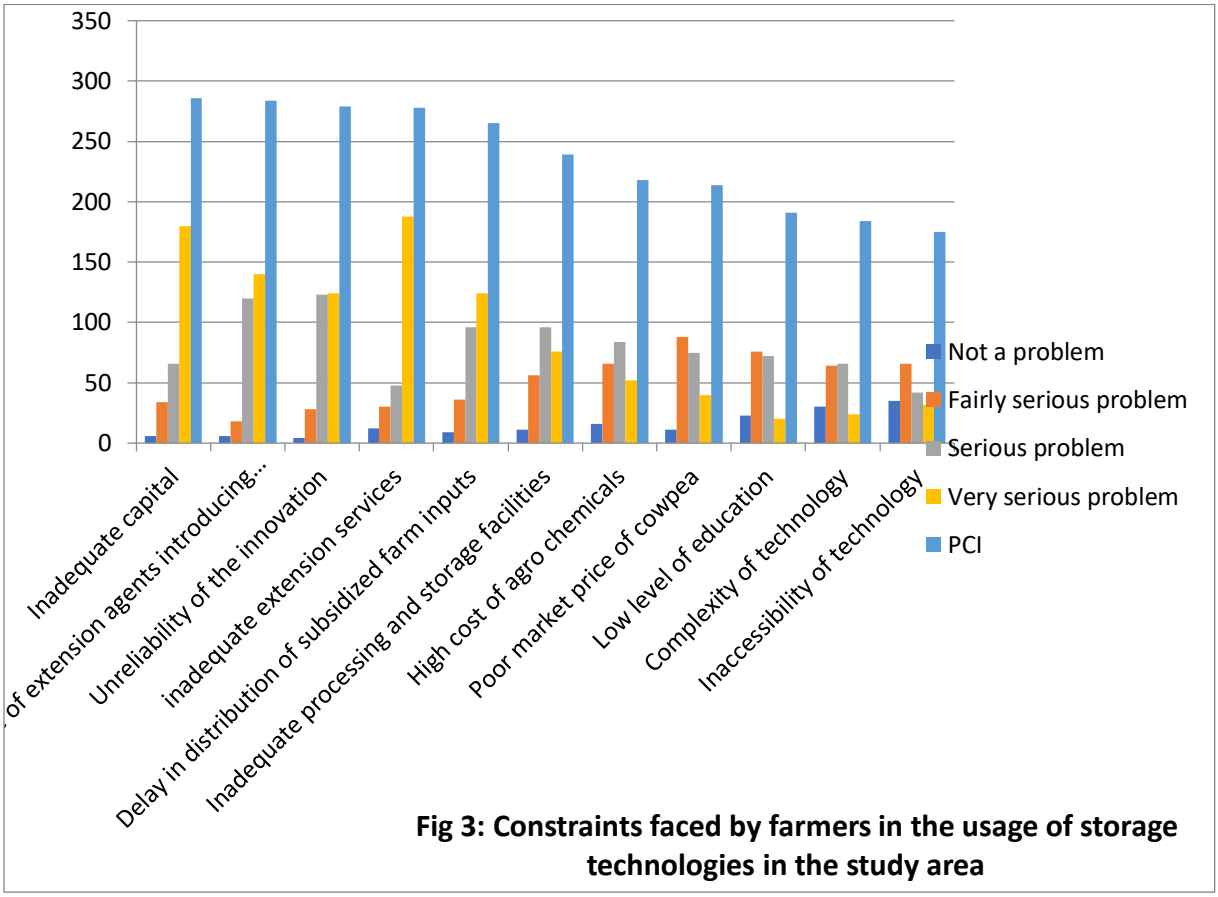

Fig 3: Constraints faced by farmers in the usage of storage technologies in the study area

Conclusion and Recommendation

Based on the findings of this study, it was concluded that majority of the cowpea farmers are male within the economically active age. Most of the cowpea farmers were married with a household size between 6 and 10 persons, and this means that most of the farmers will likely to have access to family labour. Most of the cowpea farmers had secondary education and most of them had a farming experience of 16-20 years and a farm size of 11-15 ha while majority of the farmers had an annual income between N201,00-N400,000 annually. This indicates that they are mostly smallholder farmers. The most widely used storage techniques by cowpea farmers in the study area are Pirimiphos-methyl and Alluminium phosphate while the least widely used technology is the crib. However, the most prevalent constraints the farmers face in the usage of cowpea storage technologies is inadequate capital, poor attitude of extension agents, unreliability of innovations, and inadequate extension services.

In line with the findings of the study, the following recommendations were made:

i. Financial institutions should ensure that the process of acquiring agricultural loans and credits are simplified so that the farmers can easily have access to capitals for their agricultural activities.

ii. The government and private organization involved in extension service delivery should ensure that farmers are effectively equipped with the right information on available mechanisms and how they are utilized.

iii. Farmers should be properly educated to follow the controlled dosage when using chemical substances for storing cowpea.

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Mobile Money Agents and the Financial Inclusion Drive of Central Bank of Nigeria

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Abstract

In recent time, financial inclusion has assumed a critical development policy priority in Nigeria. The inability of the Central Bank of Nigeria (CBN) to achieve financial inclusion despite all efforts yielded no desirable results. This study examined the role of mobile money agents on the current financial inclusion drive by CBN. This study employed descriptive survey, correlation analysis, structural modeling and Fleiss Multirater Kappa technique to analyze 398 survey questionnaires administered on both the customers and the mobile money agents. The result of the correlation analysis (89.7%) shows that there is a positive relationship between mobile money agents and financial inclusion drive. Though there was evidence for low quality services by mobile money agents, the mobile money agents' role can be an important tool in achieving financial inclusion in Nigeria. Therefore, it is recommended that public enlightenment campaign should be heightened, as to inform the society on the importance of financial inclusion through mobile money agents. There are reports of arbitrary charges by banks on mobile money customers. Consequently, the banks need to be more transparent and honest in dealing with their customers; hence the banks should ensure the complete removal of all unauthorized arbitrary charges against the customers' accounts. Finally, the CBN needs to adequately monitor the banks to ensure total compliance to CBN's approved charges only.

Keywords: Mobile Money Agents; Financial Inclusion; Structural Modeling; CBN.

Jel Classification: E52; E44; G18.

1.0 Introduction

Financial inclusion refers to making available the basic financial services at affordable cost to the disadvantaged and low-income segments of the society. Individuals are financially included if they use financial services from formal financial institutions. Formal financial institutions are not restricted to just the commercial banks but it includes other non-bank financial institutions such as the credit unions, cooperative societies, and other

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microfinance institutions (World Bank, 2018). The sovereign states all over the world have the sustainable development goals (SDGs) target to achieve by the year 2030. The objective of these global goals is to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. However, this cannot be achieved without advancing the course of financial inclusion since, as it is number eight (8) out of the seventeen (17) SDGs.

The principle of financial inclusion has assumed greater level of importance in recent times due to its perceived importance as a driver of economic growth (Gencer, 2016). Financial inclusion gives access to millions of men and women all over the world who are presently excluded from financial services that would provide the possibilities for the creation of a large depository of savings, investable funds, investment and hence global wealth generation (Morawcynzski& Krepp, 2016). In recent time, financial inclusion has assumed a critical position in development policy in Nigeria. However, several efforts of the Central Bank of Nigeria [CBN] to achieve financial inclusion through the introduction of Financial Inclusion Steering Committee (FISCO), Public Orientation and Education (POE), the Media Engagement Strategy (MES), as well as organizing a number of enlightenment programmes to engage the banked and the unbanked has not yielded the desired results (World Bank, 2018).

The access to financial services, which are well suited for low-income earners promotes enormous capital accumulation, credit creation and investment boom. Usually, in developing economies, the low-income earners constitute the largest proportion of the population and so controls enormous chunk of the economy's idle fund albeit held in small amounts in the hands of each of the several million members of this group (Morawcynzski et al, 2016). Harnessing and accumulating these resources provide a huge source of cheap long-term investable capital (Goss, Mas, Radcliffe & Stark, 2014).

The Bill and Melinda Gates Foundation (BMGF) in 2013 reported that more than two billion people globally are outside the formal financial sector and are either financially excluded or underserved. Increasing access to quality and affordable financial services accelerates the well-being of households, communities, and economies especially those in the developing world. One important way to deliver financial services to the poor both profitably and at scale is through digital payment platforms delivered through mobile telephony. With many challenges and difficulties, including dearth of infrastructure, policy and regulatory constraints associated with access to financial services through the bricks and mortar model, driving financial inclusion using mobile money has been considered a veritable approach, especially for rural dwellers (BMGF, 2013).

The Central Bank of Nigeria licensed twenty-one (21) mobile money operators (MMOs) as at 2021. This is to provide mobile money services to millions of Nigerians as a means of bridging the gap between the financially served, the underserved and the un-served. Notwithstanding, achieving pervasive financial inclusion through mobile money

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services has remained a global challenge. Faye and Triki, (2013) observed that it is necessary for banks and other financial institutions to take advantage of the huge untapped potential in the smaller towns and cities and provide them with the required type and form of financial services. This they have to do by deploying core banking solution (CBS) such as mobile money agencies and micro-ATMs that will support the volume and form of services required to capture the low income and rural population. However, with the current drive by both the CBN and the government, if appreciable progress must be made, the role of mobile money agents and banks in financial inclusion should be investigated. Based on these facts, the present study aims at examining the roles performed by mobile money agents in achieving financial service inclusion in Nigeria. Secondly, it aims at assessing the quality of service of mobile money agents in terms of providing access to financial services in Nigeria.

The remaining sections are structured thus: section two presents literature review. Section three presents the methodology. Section four has discussion of finding and section five presents conclusion and recommendations.

2.0` Literature Review

"When people cannot participate in the formal economy, they often are taken advantage of, they are often left without recourse, and the effects of that undermine their own ambitions and hopes for families, communities, and even countries," (Clinton, 2010 p54).

2.1 Mobile Money and Governance

2.1.1 Mobile Money Models in Nigeria

In Nigeria, mobile money operators are divided into 3 models by operations:

Bank-led model

This model is centered around a bank or group of banks seeking to deliver payment services leveraging on the mobile payment system. This license is for bank or group of banks alone.

Non-bank model

This gives the opportunity for corporate organizations to deliver mobile payment services after fully licensed by Central Bank.

Operator branded model

This model is used by mobile network operators like MTN, GLO and so on, to add value to their subscribers by providing them with a convenient way of paying for goods and services using mobile phones. Network operators do not have operating licenses; however, through partnerships with licensed mobile money providers, financial institutions like banks can offer mobile money services to their customers.

2.1.3 Mobile Money Operators in Nigeria

Mobile Money Operators (MMOs) are licensed and regulated by CBN. They are bound to follow the guidelines set for them, some of these rules/guidelines include:

i. Being fully licensed by CBN and this is subject to review from time to time after being licensed.

ii. Being issued a unique short code by Nigeria Communications Commission (NCC) that would be used as a unique identifier to carry out mobile payment services.

iii. Being issued a unique schema code by the Nigeria inter-bank settlement system (NIBSS) for managing interoperability.

iv. Register all mobile money users based on the entire Know Your Customers (KYC) system.

The mobile money system would require a registered user to activate the service before any transaction can be made and approved. Activation is done by either creating a PIN or password. Every mobile payment transaction is issued a unique reference code as to ensure transparency of mobile money operators. These are just some of the important guidelines:

Mobile Payment Process

Mobile money providers have the responsibility of putting in place and implementing a well-detailed process which is mobile money that covers the entire delivery solution. This process involves: user registration and management, agent recruitment and management, consumer protection, dispute resolution procedures, risk management processes, transaction settlement amongst others.

M-Pesa (Kenya)- Pioneer of Mobile money services in Africa

Safaricom in Kenya is the pioneer of Mobile money services in Africa with the introduction of M-Pesa. M-Pesa is a money transfer service that allows users to send text messages, deposit, and withdraw money with their mobile phones. A bank account is not needed to carry out these different transactions, which they could perform at any mobile money provider agent's place of activity. Enrollment and deposits are free of charges while other transactions are charged to make the system affordable for every user. This system was the first programme using business model in Kenya and did not face competition for almost two years after its creation. The idea behind M-Pesa was created by Vodafone in the United Kingdom to enhance financial inclusion and provide financial services to the "unbanked." Safaricom launched a pilot programme in 2005 and 2006 with less than 500 users in the region of Nairobi (Upadhyay &Jahanyan, 2016).

2.2 Empirical Review

Several authors got interested in mobile money services. For instance, Ngumbu& Mulu-mutuku, 2018) analyzed the use of mobile money based on gender using simple percentage and discovered that gender is not a factor that determines mobile money subscription. Meniago & Asongu, (2018) studied the effects of mobile money on development using simple correlation methods and discovered that mobile banking highly correlates with development while Osei-assibey& Osei-assibey (2015) studied the adoption, attitude and intention towards using mobile money and the continuance of mobile money and productivity in Kenya. The study employed simple regression and noted that the attitude of the customers towards mobile money was encouraging while about 70% of the respondents adopted the practice.

Villasenor, West & Lewis (2015) noted that access to financial services through mobile money services allows the poor to save money outside the house safety. The study also observed that it helps in mitigating the

risks that the poor faces as a result of economic shocks and also provides access to financial services. The study emphasized that mobile money services are increasingly becoming area of concern for every policymaker for the obvious reason that it has far-reaching economic and social implications. Financial inclusion through mobile money services has therefore become an explicit strategy for accelerated economic growth and is considered to be critical for achieving inclusive growth in a country. This realization, in the recent past, was the major impetus for the adoption of policies and measures aimed at growing global financial inclusion as a means of promoting world economic prosperity.

Omigie, Zo, & Rho (2017) pointed out that mobile financial service market is expanding and is replacing traditional financial services. It is important therefore to have a deeper understanding of the underlying service value that determines customer choice behavior to use mobile money services for financial market success and sustainability. The study results are relevant for attracting prospective users and give insights to managers to attaining and sustaining competitiveness in the mobile financial services market.

Mutsonziwa, &Maposa, (2016) found out that mobile money in the Southern Africa Development Community (SADC) region is significantly increasing financial inclusion. The study noted that while some people are benefiting from mobile money services, it is crucial to point out that there are people who do not have access to services from formal financial system.

Poverty is a major explanatory factor for not using mobile money services. In light of this, Mutsonziwa & Maposa (2016) revealed that mobile money in Zimbabwe came out at the proper moment and users are now enabled to access financial services in an efficient, reliable, secure and cost effective manner. Like any other form of technological innovation, mobile money is a mere tool, which on its own, cannot bring about any development, rather it is how one employs it that matters. While it has predominantly been used for sending money over long distances, it also has the potential of delivering more services, leading to financial inclusion in the developing world. The study also observed that since it is how one employs a technological innovation that matters, several factors can affect the performance of mobile money, especially government policies. If for instance, policy-makers do not come up with pro-poor policies in relation to this innovation, then one can forget about financial inclusion through mobile phones (Gosavi, 2018). The design of the mobile money product, marketing strategies, networking with other institutions such as banks and government institutions and many more factors, all contribute in determining the success of mobile money in relation to financial inclusion. This, for instance, can be done through interoperability, a process whereby information and services are shared in order to increase efficiency while reducing operational costs and complexity (Chauhan, 2015).

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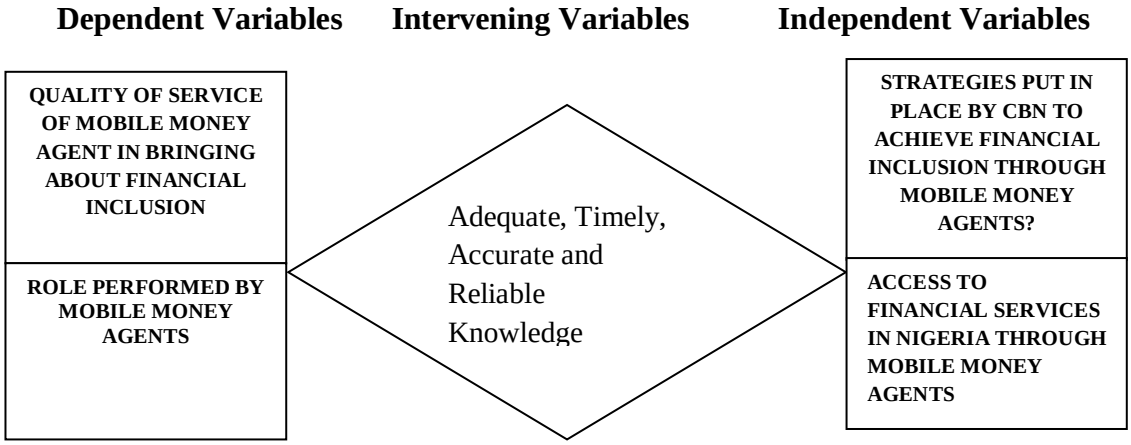
2.3 Conceptual Framework



The conceptual framework above shows the relationship between dependent and independent variables. The independent variables capture the Mobile money Agents' activities in driving the financial inclusive while the dependent Variable capture the customers which the Agents are meant to serve in the communities. The intervening variables determine how adequate, timely, accurate and how reliable the knowledge on financial inclusion of the Central Bank has been (Jackie et al, 2018).

3.0 Methodology

This study followed a mixed-method approach; the survey design (questionnaire) and focus group discussions (FGDs) in order to triangulate, authenticate and supplement findings generated through qualitative research strategies. This is in agreement with Gosavi (2018). The population of the study consisted of all mobile money agents registered under Central Bank of Nigeria and their customers. Two sets of instruments were designed; one for the mobile money agents and the other for the customers. While the one for the agents was to ascertain the roles, the other was to ascertain the quality of services rendered by the agents to the customers.

The population of the study consists of 65,753 mobile money agents registered under the Central Bank of Nigeria, while the sample size was obtained using Yamane (1967) formula given as:

$$n = \frac{N}{1 + N(e)^2} \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where: n = Sample size, N = Finite population, e = Level of Significance = 5% (0.05), 1 = Constant. Using this gives us atotal sample size of 398. However, a total of 400 structured questionnaires were distributed using stratified random sampling technique but only 398 were retrieved and analyzed. The questionnaire comprises of questions used to elicit data on different areas of financial inclusion. The questionnaire was divided into two parts – A and B. Part A consists of the demographic variables of the respondents (mobile money agents and the costumers they service) while part B consists of twenty-two (22) opinion statements designed in a 5-Point Rating Scale showing

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Strongly Disagree (SD) = 1, Disagree (D) = 2, Neutral (N) =3, Agree (A) = 4 and Strongly Agree (SA) = 5. However, for the focus group discussion, the study developed an interview guide which centered on generating the roles and the quality of services rendered by the mobile money agents in the study area. The study interviewed 33 key informants. These were mobile money agents that have operated for more than five years. These instruments were validated by experts before the administration was made. The reliability test was conducted using the Cronbach Alpha Reliability Test method and the reliability co-efficient of 0.75 was established, indicating that responses from our respondents are strongly reliable and consistent.

4.0 Data Analysis and Interpretation of Results

The rationale for this research is to examine the roles performed by mobile money agents in achieving financial service inclusion in Nigeria and to assess the quality of services of mobile money agents in term of providing access to financial services in Nigeria.The reactions to the following research questions have offered some insights into the direction of emphasis for this research work.

Table 1: Coding variables with questionnaires

Coding	Variables	Questions from the questionnaire
VAR00001	A	Mobile money agents are important in bringing about financial inclusion in Nigeria
VAR00002	B	The roles performed by mobile money agents are critical and influence financial inclusion drive of CBN
VAR00003	C	The CBN put some strategies in place to achieve Financial Inclusion through mobile money agents
VAR0004	D	Mobile money agents render quality services in term of providing access to financial services in Nigeria
VAR0005	E	The services provided by the mobile money agents have great effect in providing access to financial services in Nigeria
VAR0006	F	There is no other agency that can provide financial services in rural areas like the mobile money agents.

Source: Authors' Computation, 2021

N.B: Table 1 above explains the link between the questionnaires, the coding pattern, and the variable in alphabets representing the questionnaires. Hence, the coding and the variable names may be used interchangeably.

Table 2: Descriptive Statistics

Descriptive Statistics

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	N	Minimum	Maximum	Mean	Std. Deviation
V1	398	1	5	3.36	1.034
V2	398	1	5	3.51	1.445
V3	398	1	5	3.73	1.340
V4	398	1	5	2.36	1.347
V5	398	1	5	2.34	1.259
V6	398	1	6	3.94	1.346
Valid N (listwise)	398				

Source: Authors' Computation, 2021

The Descriptive Statistics in Table 2 above showcases the relationships among the pooled questionnaires administered to 398 respondents across the respondents. It shows the summary statistics of the variables used in the study.

The fifth column contains the mean result for the entire questionnaire administered in this study. The mean is one of the important tools in statistics for measuring central tendencies. The third and fourth columns record the minimum and the maximum value for the entire questionnaire administered in this study. Column six reports the results from standard deviation. The result has all the mean of questions to be closer to the maximum of five (5) than the minimum except for questions 4 and 5 respectively. The implication of this is that the respondents are skewed towards the maximum and homogenous in their likelihood of experience in performing the roles of achieving all financial service inclusion in Nigeria and assessment of the quality of services.

Correlations Analysis

Table 4: Pearson Correlation Analysis Showing Time Management and Organizational Performance.

		Mobile Money agents	**transactions and financial activities**
Mobile Money agents	Pearson Correlation	1	.897**
	Sig. (2-tailed)		.000
	N	398	398
	Pearson Correlation	.897**	1

transactions and financial activities	Sig. (2-tailed)	.000	
	N	398	398
**. Correlation is significant at the 0.01 level (2-tailed).			
Source: Author's Computation, 2021.			

From the result, the coefficient of the independent variable is correlated at 0.897 **, when the p-value is 0.000 < 0.01. This signified a strong correlation. Thus, there is a positive relationship between the Mobile Money agents and transactions and financial activities. Thus mobile money agents enhance transaction and financial activities.

Structural Equation Modeling

Table 5 reports the result from combined impacts of responses that culminated into the assessment of the roles performed by mobile money agents in achieving all financial service inclusion in Nigeria and also to assess the quality of service of mobile money agents in terms of providing access to financial services in the study area.

Table 5: Structural Equation Modeling

Structural Equation Modeling					
Total no of observation		398			
Exogenous variables		B C D E F			
Structural Variables					
Variable	Coefficient	Std. Err.	P>|z	[95% Conf. Interval]	
B	.2194894	.1252341	0.000	-.025965	.4649438
C	.680696	.1029871	0.000	.5788459	.9825479
D	- .7837646	.0845891	0.004	-.3395561	-.007973
E	-.0450846	.1171896	0.000	-.1846028	.274772
F	-.1570576	.0652479	0.016	-.2849412	-.029174
Cons	.7839267	.7755659	0.312	-.7361546	2.304008

Source: Authors' Computation, 2021

Recall that A which is the dependent variable is premised on possible assessment of importance of mobile money agents in bringing about financial inclusion in Nigeria. Question B assesses the roles performed by mobile money agents and how it influences financial inclusion drive of CBN while D assesses the quality of services rendered by the agents, which was estimated from the instruments administered to the customers.

From the responses on the roles performed by mobile money agents and how it influences financial inclusion drive of

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CBN, most of the respondents responded positively that mobile money agents influences the financial inclusion drive of CBN, as the coefficient of the variable is positive and statistically significant. In fact, a unit of an increasing level of high responsibility in the role of the mobile agents in the area under investigation could increase financial accessibility of the mobile money customers by 22 units in the average. Again, on the strategies put in place by CBN to achieve Financial Inclusion through mobile money agents, the result revealed that about 78% of people in the average were of the opinion that the strategies put in place seems to achieve the CBN financial inclusion. The implication here is that the financial inclusion drive of the CBN yields some benefits through personal and business transactions, extending the reach of banks and integrating rural dwellers into the formal financial system and increasing access to finance. This finding corroborates the study of Gosavi (2018) in the study of Eastern sub Saharan Africa.

In addition, the study wanted to assess the quality of Service of mobile money agents in term of providing access to financial services in Nigeria. It appears as if there is an indirect relationship with the roles of mobile money agents, as the coefficient was negative, and the p-value was statistically significant. Again, the claim is supported as the response to knowing whether the agents professionally renders quality services to their customers is statistically significant. It therefore indicates that there is strong evidence that there is low quality of services by mobile money agents. This may negatively affect the rate of achievement of financial inclusion of the CBN. This finding is in line with Nault & Dexter, (2015), Parasuraman, Zeithaml & Berry (2015) and Hurley &Estelami (2018) who noted that product quality is easier to measure than service quality. These authors have the views that service quality can be derived from the gap that exists between performance of service and expectation of service quality. However, performance dimensions can be used to measure service quality. They observed that perceived service quality can be measured using service quality dimensions, pointing out that service quality is multidimensional. On this note, Gronroos (2014) found that service quality has got three perspectives: technical standards of service quality; employee component and Information Technology component. The technical standard of service quality concerns the service specifications or the process metrics.

Table 6: Fleiss Multirater Kappa

Overall Agreement[a]	Kappa	Asymptotic Standard Error	Z	Sig.	Asymptotic 95% Confidence Interval	
					Lower Bound	Upper Bound
Overall Agreement	-0.088	0.020	-4.382	0.000	-0.128	-0.049

a. Sample data contains 398 effective subjects and 6 raters

Source: Authors' Computation, 2021

In rating the general level in the quality of services rendered by the mobile money agents, the study further conducted Fleish Kappa asymptotic rating over all the responses from the respondents. The result again is significant but the coefficient is negative showing dissatisfaction in the low quality of service rendered in the area under investigation. For asymptotic confidence interval, the coefficient value falls within the lower and upper bound but skewed closer to the upper bound margin.

Table 7: The significant of Mean value of the entire administered questionnaire.

Mean Averages	Coefficient	Std. Error	P>|z	[95% Conf. Interval]	
mean(B)	3.7450	0.1937	0.000	4.1249	3.3652
mean(C)	3.6470	0.1877	0.000	4.0149	3.2791
mean(D)	2.0196	0.1989	0.000	2.4095	1.6296
mean(E)	2.4901	0.1867	0.000	2.8562	2.1241
mean(F)	3.8627	0.1881	0.000	4.2314	3.4940

Source: Authors' Computation, 2021

Recall that the mean is one of the reliable measures of central tendencies in statistic. The mean value of the administered questionnaires is statistically significant at 1 per cent level of significance. This indicates that the relationships of all the questions towards accessing mobile money from the agents are normally distributed and adequately skewed.

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Table 8: The significant of covariance of the entire administered questionnaire.

Cov. Of Variable	Coef.	Std. Err.	P>|z	[95% Conf. Interval]	
Cov(B,C)	1.6943	0.3518	0.000	1.0047	2.3839
Cov(B,D)	-1.6420	0.3587	0.000	-2.3452	-0.9389
Cov(B,E)	-1.7377	-0.3550	0.000	-2.4336	-1.0419
cov(B,F)	1.3179	0.3191	0.000	0.6924	1.9434
cov(C,D)	-1.6401	0.3519	0.000	-2.3300	-0.9502
cov(C,E)	-1.5916	0.3352	0.000	-2.2487	-0.9346
cov(C,F)	1.3044	0.3113	0.000	0.69421	1.9147
cov(D,E)	1.5590	0.3436	0.000	0.8854	2.2325
cov(D,F)	-1.546	0.3440	0.000	-2.2205	-0.8720
cov(E,F)	-1.168	0.2995	0.000	-1.7550	-0.5809

LR test of model vs. saturated: X^2) = 0.00, Prob > X^2.

Source: Authors' Computation, 2021.

Covariance in this study measures the directional relationship between the returns on two questions relating to the role of mobile money agents and the quality of service rendered to their customers. A positive covariance means that related questions jointly move together while a negative covariance means they move inversely in explaining availability of quality services within their roles to achieve financial inclusion. Covariance is a measure of the relationship between two random variables. The metric evaluates how much – to what extent – the variables change together. In other words, it is essentially a measure of the variance between two variables. However, the metric does not assess the dependency between variables.

From Table 8 above, all variable questions are jointly significant as the result indicates. The implication of the well fitted covariance in this study's question is that there is a linear measure of "question connectivity." It is positive when the two variables you have at

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hand are positively connected. Thus, the model questions' covariance is significant because it measures randomness. Hence, the relationship is close to zero in random variables.

The results from the focus group discussion (FGDs)

The study also employed qualitative responses from focus group discussions (FGDs) and key informant interviews. The following questions were asked: How fast/long does it take the mobile money operators to attend to your services? Have the mobile money agents/operators defaulted in serving you? Do you think that mobile money platforms can deepen the CBN financial inclusion of the unbanked?

This study assumes that the time it takes to attend to customers' needs such as the time it takes to do fund transfers, withdrawals and so on to a large extent shows the quality of the service rendered. Using a detailed time allocation record, respondents were requested to recall the time spent to do fund transfers, withdrawal of funds etc. The results are presented thus:

Table 9: Results of the *Focus Group Discussion and the interviews*

Features	Questions	Agents M(SD)	Customers M(SD)	t-test
Gender	Female	3(24.8)	3 (11.8)	2.11**
	Male	12 (40.3)	5(17.2)	0.21***
	TOTAL	15 (26.3)	12 (26.7)	
Quality of service	It take the mobile money operators to a very long time to attend to customers	4 (41.6)	8 (22.1)	0.36**
	There has been a default in service from the mobile money operators?	2 (25)	10 (6.2)	3.54**
	TOTAL	14 (23.3)	10 (16.7)	18.36**
Deepening of financial inclusion drive of CBN	Mobile money platforms can deepen the CBN financial inclusion of the unbanked?	3 (25)	2 (16.7)	3.56**
	Arbitrary bank charges discourage the customers from fully participating in the mobile bank	4 (41.6)	8 (22.1)	0.36**
	TOTAL	14 (23.3)	10 (16.7)	

Source: Authors' Computation, 2021

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M denotes Mean while SD denotes Standard Deviation

In the focus group discussion, the study asked respondents if they think that mobile money platforms can deepen the CBN financial inclusion of the unbanked. The response of the customers differed slightly from those of the agents/mobile money operators. The results above shows that on the quality of services rendered by the agents, while the customers admitted that it takes longer hours to attend to them, the agents/mobile operators admitted lesser hours. On the questions that geared toward the agents defaulting in certain services, the customers admitted that the agents default in certain services while the contrary was the views of the agents, as no one would naturally blame oneself on certain matters. Furthermore, on the questions if mobile money can deepen the financial inclusion of the CBN, while the agents strongly agreed, the degree of customers' agreement was less. This result corroborates the results of the structural equation modeling in table 4 where this study observed a negative coefficient and statistically significant of the p-value. This indicates that there is strong evidence that there is low quality of services by mobile money agents. The implications here is that this may negatively affect the rate of achievement of financial inclusion drive of the CBN. They were further asked about what discourages them from patronizing the mobile money operators. The responses were far-reaching. About 80 per cent blamed non transparency and the arbitrary charges by the banks on transactions made via point of sales (POS) platform.

5.0 Conclusion and Recommendations

There is a general consensus in the poverty reduction discourse that poverty does not only refer to low levels of income but is also closely related to vulnerability and social exclusion. People who are socially excluded in the society find themselves without the necessary tools to participate fully in the development of their own community and society.

Financial exclusion is a form of social exclusion whereby a certain sector of the society is deprived of formal financial services. Generally, these are people who reside in rural areas where formal financial institutions find it too risky to invest for fear that they may not be able to recover their costs. However, the central bank of Nigeria have taken a drastic steps to make such sector of the society participate fully in the development of their community by embarking on mobile money through the registration of mobile money agent. The study finds out that the mobile money agents are key elements in achieving financial inclusion because of the role they play. Through mobile money agents, more people are enabled to assess financial services. The study recommended therefore that banks need to be more transparent and honest in dealing with their customers; hence the banks should ensure the complete removal of all unauthorized charges arbitrarily debited to customers' accounts. The CBN needs to

adequately monitor the banks to ensure total compliance to CBN approved charges only. There should be an increase in public enlightenment campaign to emphasizing the benefits of financial inclusion to everybody using different languages, rather than just the middle class and the elite as it is currently done.

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Effect of Bank Loans on Agricultural Output in Nigeria

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Abstract

This study empirically assessed the impact of commercial banks' lending on agricultural output in Nigeria from 1985 to 2019 by specifically ascertaining the impact of commercial banks' lending on real gross domestic product and index of industrial production. The data sourced from the Central Bank of Nigeria statistical bulletin were diagnosed for unit root and stationarity. The Johansen co-integration revealed a long run relationship between commercial banks' lending and gross domestic product but such could not be said for index of industrial production. The granger impact assessment result shows that commercial banks' lending has significant impact on agricultural output in Nigeria. The vector error correction model depicts that for achievement of long term growth and development of the Nigerian economy, commercial banks' lending is very pivotal as the high interest rate charged by commercial banks' remain a threat to the positive influence of banks' credit to the economy. The Central Bank of Nigeria should implement regulation to stop banks from centring loans and advances to a particular sector which is, oil and gas to improve credit flow to other strategic sectors, especially agriculture and industries to increase their contributions to agricultural output in Nigeria. The monetary policy of the Central Bank of Nigeria should complement fiscal policies of the government to reduce the level of inflation in country, having regard to its negative effect on index of agricultural production.

Keyword: Bank Loans, Bank Interest Rate, Government Expenditure on Agriculture, Agricultural Development

Introduction

Commercial banking activities play a facilitating role in promoting economic development in developing countries. More than half of the population in developing countries is involved in traditional agriculture and subsistence farming (World Bank, 2017). This portion of the population is often faced with myriad of problems including underdeveloped transport system, a critical shortage of capital and lacks initiative for enterprise development (Qureshi, Akhtar & Shan, 1996; and Ijere, 1986). Other

identifiable causes of the lack of investment include specific cultural or social issues and government policies that raise the cost and risks of investment Wells (1970). Several factors account for the poor performance of the agricultural sector in Nigeria. These include: virtual neglect of the sector, poor access to modern inputs and technology, and lack of optimum credit supply (Enyim, Ewno& Okoro, 2013). Aside the problem of poor access to modern technology, the major bane of agricultural development in Nigeria is low investment finance (Salami &Arawomo, 2013).

According to Udih (2014) Bank loans are expected to impact positively on the investible sectors of the economy through improved agricultural production of goods and services. He opined that sufficient financing of agricultural projects will not only promote food security, but also enhance the entrepreneurship performance of our young investors. Concluding that, this is borne out of the expectation that a good match between adequate bank credit and agricultural entrepreneurship will ensure massive agricultural productivity. Qureshi et al (1996), in their contribution argued that Banks credit has the capacity to remove the financial constraints faced by farmers, as it provides incentives to enable farmers to switch quickly to new technologies which can enhance the achievement of rapid productivity and growth. Ijere (1996) viewed banks' credit as a catalyst that can activates the engine of growth enabling it to mobilize its inherent potentials and to advance in the planned or expected direction. In support of the same view, Umoh (2003) maintained that banks' credit constitutes the power or key to unlock latent talents, abilities, visions and opportunities, which in turn act as the mover of economic development. Banks' credit has a significant contribution to economic development by enhancing production and productivity and thus higher income and better quality of life to the people. (Well, 1970).

Over the years, the Federal Government of Nigeria through monetary authorities has been implementing monetary policies which have influenced commercial banks' abilities to perform and play their expected roles. For instance, in the 1959-1986, government implemented regulated monetary policies during which all monetary variables such as interest rates, and volume of bank credits were fixed by monetary authorities. But, with the introduction of the Structural Adjustment Programme in 1986, monetary policies were deregulated. Thus, interest rates and amount of credits were determined by individual bank.

Agricultural financing has suffered a great set back in Nigeria. Perhaps this is due to the fact that agricultural lending is considered to be more risky, problematic and unprofitable relative to other sectors (Enyim et al 2013). To this end, the commercial banks which are the major conventional financial institutions have no kin interest in agricultural finance (Obilor 2013). In the days of sectoral allocation, the agricultural sector was favoured and banks complied because of the penalties involved of which some of the

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banks even preferred to pay than to comply (Gurdenson, Glory & Due, 2003).

From available statistics of banking sector total sectorial credit distribution in Nigeria, the allocation to the agricultural sector, has been insignificant. For instance, credit allocation to the sector fluctuated between 6.98% and10.66% in 1981 to 1985; between 10.66% and 16.15% in 1985 to 1990; between 16.15% and 17.5% in 1990 to 1995. It declined sharply to 8.07% in 2000, 2.46% in 2005, and 1.67% in 2010, and fluctuated between 1.67% and 5.44% in 2010 to 2017 (CBN, 2017).

Central Bank of Nigeria(2009) reported that the contribution of agricultureto GDP fell from 48% 1970 to 20.6% in 1980 and was only 23.3% of GDP in 2005.National Bureau of Statistics(2013) also reported that the sector's contribution to the growth of the Nigerian economy in 2012 stood at 39.21 and 41.93% improvement in the third quarter of 2013. The sector recorded growth rate of 3.83% in the fourth quarter of 2012 as against 5.68 in the fourth quarter of 2011. Output in the third quarter of 2013 stood at 5.08%, up from the 3.89% recorded in the corresponding period of 2012 and also higher than the 4.52% recorded during the second quarter of 2013 with a low level of job creation as compared to education, financial intermediation, among others. Despite the involvement of commercial banks through loans, hunger, malnutrition, mass poverty and high income inequality, among small groups of businessmen and farmers, unemployment and underemployment, lack of executive capacity, over dependence on petroleum and imports of goods and services continues to take a turn for the worse thereby leading to poor agricultural output in Nigeria. The duo crisis of food and finance around the world had left agricultural export and economic growth on its lowest ebb in Nigeria. Other factors that have hampered the the good performance of banks loans on agricultural output include rising costs of productivity due to poor infrastructural facilities such as inadequate provision and/or erratic supply of electricity and lack of incentives to genuine farmers. These sluggish performances especially the decreased sector contribution from 6.5% in 2005 to 4.1%in 2012 of the agricultural sector in spite of the involvement of commercial banks motivate the urgent need to examine the trend and effect of banks loans on agricultural output in Nigeria.

2. Literature Review

2.1 Conceptual and Theoretical Review

Loan in its simplest form is temporary given money to somebody with the intent that it will be repaid within a stipulated period of time. In the banking industry, credit/loan attracts some fee called interest. Commercial banks are financial institutions established to carry out banking operation and maximize returns to their shareholders. Banks not only grant loans and advances to customers just to fulfil their operational functions but also to make profit. This profit can only be earned through the interest charged on loans and advances to customers (Anyanwu, Ananwude& Okoye, 2017).

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The interest charged by banks on loans are normally arrived at by taking into account the prevalent market rate as well as the monetary policy rate of the Central Bank of Nigeria (CBN). The interest rate of banks are usually higher than the monetary policy rate of the apex bank and incorporated with other charges such as administrative fee, handling/processing fee etc. as determined by the banks from time to time. Lending is one of the main activities of commercial banks and other financial institutions in Nigeria as evident by the size of loans that form banks' assets and the annual substantial increase in the amount of credit granted to borrowers in the country (Akujuobi & Nwezeaku, 2015).

Government total expenditure on agricultural is made up of capital expenditure, and recurrent expenditure. Public expenditure plays dual role in agricultural production and food security. On one hand, it is one of the determinants of agricultural and food production, and on the other hand, public recurrent expenditures on salaries and wages determine people's ability to purchase food items necessary for decent living. In view of this Nigeria government make budgetary allocations to agricultural sector as well as payment of salaries every year (Bello, 2004).

The goal of every nation, especially developing countries is to achieve a desired and sustained level of food production and supply. This is cannot be argued because ensuring a comfortable state and improving standard of living of all citizen is the priority of every government today. Agricultural development refers to sustained improvement in agricultural output in an economy over time (Nafziger, 2006). Agricultural development is the improvement in the agricultural productivity, economic well-being and standard of living of the farmers in particular, increased food supply and food security, reduction in poverty, increasing national income, and increasing gross domestic product, among others. Consequently, developing countries usually initiate programme for precipitous rural and agriculture development in the bid to escape from underdevelopment.

Several theories can be used to explain the relationship between banks loans and agricultural output. Cobb & Douglas (1928) propounded a theory of economic growth to explain the relationship between production (and therefore economic growth), labour and capital. Based on data on population, capital and production for the period 1899 to 1922, Cobb-Douglas (1928) established that output was a function of labour supply and capital connected within a given level. The capital component provided the way through which lending enters the equation. A significant portion of credit borrowed from banks or elsewhere is used for capital accumulation. The accumulated capital becomes one of the variables of economic growth in the Cobb-Douglas theory (King & Levine, 1993b). This theory is relevant to this research for it provides a mathematical connection between production, labour and capital though it was operational within a context of constant technology. Loans given by the banks are used as capital for the production process whose change indicates growth. This theory

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therefore provides the connection between capital and growth (Shan & Jianhong 2006).

2.2 Empirical Review

Gonzalez-Vega & Graham (1995) examined the potential role of state-owned agricultural development banks as a source of micro-financial services. It first discusses elements of a new consensus on microfinance, including the importance of formal and informal finance for the poor, the consequences of credit rationing, and progress in micro-financial technologies. While key lessons are identified from past experiences of government intervention in financial markets and from new experiments in microfinance, no dominant organizational model emerges among examples of best practice. They provided a conceptual framework to interpret the failure of state-owned agricultural development banks, their lack of success in reaching the poor, and their lack of viability. Key defining dimensions deserve special attention: (a) their specialization in agricultural credit, with the accompanying instances of market failure and high monitoring costs as well as the negative impact of policies that penalize agriculture; (b) their development orientation and lack of profit motive; (c) their possession of a bank charter which authorizes deposit mobilization; and (d) state ownership, with the resulting inadequate level of internal control and incentive problems.

Swinnen & Gow (1999) assessed the problems of financing Central and Eastern European agriculture during the present transitionary period and the role of government in this process. Initially the paper looks at why credit markets work imperfectly, even in well-developed market economies, focusing on problems related to asymmetric information, adverse selection, moral hazard, credit rationing, optimal debt instrument choice and initial wealth. It shows why these and related problems may cause transaction costs to be so high that credit rationing and high interest rates are rational and efficient responses by lenders to the imperfect information problems of the agricultural sector. A series of specific, transition-related issues are then discussed which have worsened these problems within the Central and Eastern European agricultural sector. The potential roles of governments in solving these issues and actual observed interventions by Central and Eastern Europe governments through credit subsidies, loan guarantees and specialised agricultural lending institutions are analysed.

Back in Nigeria, Udih (2014) investigated banks credit and agricultural development. The paper used primary and secondary sources of information that were extracted from five (5) banks and ten (10) agricultural enterprises in Delta State. A simple random sampling technique through the lottery method was adopted to select the samples. The data were analysed using percentage, mean, and Standard Deviation and Pearson product moment correlation to test the hypotheses. The research findings include: that banks' credits and advances to agricultural entrepreneurs promotes agricultural development and productivity, and that regulated banks' credits to the

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agricultural entrepreneurs has no or little impact on the entrepreneurship performance, and thus, suggested that adequate bank credits should be granted to small scale agricultural farmers to increase productivity: and their farms land should be used as collateral instead the of usual banks' loan security to promote entrepreneurship performance.

Kareem, Bakare, Raheem, Olagumela, Alawode & Ademoyewa (2013), examined the factors influencing Agricultural output in Nigeria: Macro-economic perspectives. The study seeks to determine the factors influencing agricultural production in Nigeria, and also determine the causality between Agricultural outputs and macro-economic variables. The study adopts regression analysis, descriptive statistics and the Granger causality tests on macroeconomic variables (i.e. Food import value, Interest rate, Commercial bank loans on Agriculture, GDP growth rate and Foreign direct investment) to find the significant relationship between the different variables chosen. The result shows fluctuations in the trend of variables considered (i.e. Interest rate, Commercial bank loans to Agriculture, GDP growth rate and foreign direct investment) in relation to the period under review. The result further shows that foreign direct investment: commercial bank loan, interest rate and food import value have positive relationship with Agricultural output.

Obilor (2013) examined the impact of Agricultural Credit Scheme Fund, agricultural product prices, government fund allocation and commercial banks' credit to agricultural sector on agricultural productivity. The result revealed that Agricultural Credit Guarantee Scheme Fund and Government fund allocation to agriculture produced a significant positive effect on agricultural productivity, while the other variables produced a significant negative effect. Nwankwo (2013) examined agricultural financing in Nigeria and its implication on the growth of Nigerian economy using ordinary least square method and quantitative research design. The study revealed that there is significant relationship between agricultural financing and the growth of Nigerian economy and that the level of loan repayment rate over the years has indeed negatively impacted significantly on the growth of Nigerian economy.

Ogbanje, Yahaya & Kolawole (2012) examined the effect of commercial banks loan on the agricultural sector in Nigeria from 1981 to 2007. Growth in agricultural sector was expressed in terms of agricultural Gross Domestic Product (GDP). Secondary data for the study were obtained from the Central Bank of Nigeria. Findings revealed that commercial banks loan to the agricultural sector increased substantially from N590.6m in 1981 to N4.221.4m in 1990, a 614.76 percent increase. From 1991, the loan stock rose from N5,012.7m to N146,504.5m in 2000, representing an increase of 2822.67 percent. There was, however, a sharp decline in loan stock from N200,856.2m in 2001 to N149,578.9m in 2007. Over the period of study, agricultural GDP showed declining growth rate. Nevertheless, agricultural GDP

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grew from N84,428.5m in 1981 to N267,051.7m in 2007. The ordinary least square method, with lagged dependent variable, revealed that commercial banks' loan positively affected agricultural GDP at 0.01 level of probability. Hence, commercial banks' loan has contributed significantly to agricultural development in Nigeria.

Enyim et al (2013) examined banking sector credit and performance of the Agricultural sector in Nigeria. The study applied econometric tests such as unit root, cointegration and its implied error correction model and Grange causality test, in which changes in AGDP was regressed on commercial bank credit to agriculture. The result of the analysis shows that the total money stated as Government Expenditure on agriculture is not statistically significant and not theoretically in line. However, the result shows that commercial banks' credit to the agricultural sector has a positive relationship with agricultural productivity.

The empirical studies considered above showed that there is no consensus on the nature and magnitude of the linkage between banks' lending and agricultural development due to the ambiguity of the nexus between these variables. Again, it may be observed that none of the studies reviewed above included other determinants of agricultural development such as banks' interest rate and government expenditure as explanatory variables. Therefore it would be necessary to include these factors as allowed by the available data. These observed shortcomings have created a knowledge gap in the literature, thus necessitating a more systematic examination of the phenomena of interest, that is, the analysis of long run relationship between banks' lending and agricultural development. Another important shortcoming of most previous studies reviewed above which the current study seeks to overcome is that explicit attention was not paid to the time-series characteristics of the data used. Using recent developments in time series econometrics, this study will distinguish between long- and short-term relationship between banks loans and agricultural development. This is the gap this study intends to fill using Nigeria as a study.

3. Methodology and Data sources

This study adopted analytical method to empirically analyse the impact of banks loans on agricultural output in Nigeria during the 1985-2019. To this end, the study uses secondary data on included variables and the method of co-integration analysis based on autoregressive distributed lag (ARDL) to carry out the analysis. The error correction mechanism (ECM) and Granger Causality tests were employed to determine whether or not there is causality among the variables. The data would be collected from various sources including Central Bank Nigeria (CBN) and National Bureau of statistics (NBS).

This study is rooted in Cobb & Douglas (1928) theory of economic growth which hypothesized that production is a function of labour (L) and capital (K). The Cobb-Douglas production function (as it later became known), is a tool in theoretical and empirical analysis of growth and

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productivity. It is widely used to represent the relationship of an output to inputs. Essentially, it considers a simplified view of the economy in which production output (P) is determined by the amount of labour (L) involved and the amount of capital (K) invested, resulting in the following equation:

$Y = bL^{\alpha}K^{\beta}$……..3.1

Where α and β are the output elasticities of labour and capital respectively. These values are constants determined by available technology. This model has been subjected to critical analyses since its inception (see for example, Samuelson, 1979 and Felipe and Adams, 2005). According to Tan (2008), there are concerns over its application in different industries and time periods. Tan argues that Cobb and Douglas were influenced by statistical evidence that appeared to show that labour and capital shares of total output were constant over time in developed countries. However, there is doubt over whether constancy over time exists. This argument is premised on the fact that the nature of the machinery and other capital goods (the K) differs between time periods and according to what is being produced. The same applies to the skills of labour (L).

Notwithstanding its weaknesses, the Cobb-Douglas model has attractive mathematical characteristics, such as highlighting diminishing marginal returns to either factor of production. It is in this regard that we utilize it in this paper to estimate agricultural output as a function of credit, capital accumulation, labour and rainfall, an approach applied by Iqbal et al., (2003), Ahmad (2011) for Pakistan and Bernard (2009) and Enoma (2010) for Nigeria. Having regard that the production function is non-linear, we log-transform the Cobb-Douglas model to derive the following equation:

LnAGDP = β0 + βlnCredit + β2 lnLabour + β3 lnCapital accumulation + β4lnRainfall + Ut……....3.2

A modified model of Agunuwa et al (2015) for a study in Nigeria which follows Chisasa& Makina (2013) was adopted for this study. The functional form of Agunuwa et al (2015) model is expressed as:

AGP = b0 + b1CBCA + b2INF + b3FER + Ut…….….3.3

Where: AGP = Agricultural Productivity,

CBCA = Commercial banks' credit to the agricultural sector, INF = Inflation rate, FER =Foreign exchange rate, Ut = Error term, and b1 > 0, b2 < 0, b3 > 0.

Since Agunuwa et al (2015) model adopted in this study is an optimization model it is suitable for application in Nigeria. We modify equation (3.2) above by replacing inflation rate and foreign exchange rate with banks' lending rate of interest and government expenditure on agriculture respectively. Thus, the model specified for this study is shown below:

AGPt = b0 + b1CBLt + b2INTt + b3GEAt + Ut……..……3.4

Where:

AGPt = Agricultural Productivity at time t;

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CBLt = Commercial banks' lending to the agricultural sector at time t;

INTRt = Interest rate on Commercial banks' credit to agriculture at time t;

GEA = Government expenditure on the agricultural sector at time t; and

Ut = Error term

Econometrically transforming the model by introducing log to ensure equal numerical base of dependent and independent variables for easy interpretation of coefficient value, the following model was developed:

$$LnAGPt = b0 + b1lnCBLt + b2lnINTt + b3lnGEAt + Ut \quad \ldots\ldots 3.5$$

Where: Ln = Logarithm. The a priori expectations of the study are that, b1, b3 > 0, and b2 < 0.

Equation (3.5) will be estimated using the Ordinary Least Squares (OLS) multiple regression technique. Annual data on the included variables during the 1985-2020 shall be used. Before estimation, we will determine whether the variables are stationary or not. This will determine the underlying properties of process that generate our time series data. In addition, the Augment Dickey-Fuller (ADF) t-test shall be used to determine the order of integration.

The data collected for the study would first be subjected to diagnostic test to determine whether or not the variables have long run relationship with one another. To achieve this, we employ the following test methods.

Here, we examine the stationarity of the variables under consideration in order to avoid having spurious result, and to determine the co-integration properties of all the variables included. The unit root property requires all variables to be stationary in levels or first differences.

Using Agunuwa et al (2015) this study will employ augmented Dickey-Fuller (ADF) unit root test to detect the presence or otherwise, of unit root in the series. To carry out the ADF test, the following model will be estimated.

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \Delta Y_{t-1} + U_t \quad \ldots\ldots 3.6$$

Where:

Y_t = variable under investigation;

$\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2})$;

And U_t = pure white noise error term

The null hypothesis of non-stationary is rejected if the t-statistic (i.e, the calculated value of t) is greater than critical (or tabular) t-value, or otherwise.

The co-integration property requires all variables to converge in the long run Agunuwa et al (2015). To carry out the co-integration test, we employ Johansen co-integration method. Using this method, the null hypothesis of no co-integration is rejected if the calculated value is greater than the tabular value (at a chosen relevant significance level), or otherwise. This test is carried out only if the variables are co-integrated (meaning that they are most likely to converge in long run). To achieve this, we

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employ the Engle-Granger method. Thus we use an error correction method as:

$DAGP_t = a_o + a_1 L (\Delta Z) - a_2 ECM_{t-1} + \lambda_t$ ……. 3.7

Where Z is the Vector of Variables that co-integrated with loans and advances, L is a general lag operator, and ECM is the time series of residuals from co-integrating vector. The error correction model in its log-linear form is:

$\Delta lnAGP_t = w_o + w_i \Delta lnCBL_t + w_2 \Delta lnINT_t + w_3 \Delta lnGEA_t + Ut\text{-}1$……..…3.8

Δ = First Difference;

U_{t-1} = One period lagged value of the residual, i.e, the error correction factor whose coefficient should be negative and statistically significant to support the presence of co-integration.

As explained in equations (3.1-3.8) above, the use of these methods is justified on the ground that they have been used by many authors at different times and places in the past. For instance, studies by (Chisasa& Makina (2013); and Agunuwa et al (2015).) used the methods discussed above at different times and places. These methods are rooted in (Cobb-Douglas, 1928) with modifications.

4. Data Presentation and Analysis of Results

4.1 Unit Root Test

According to Augmented Dickey-Fuller (1979) and Philips and Perron, there is likelihood of obtaining a spurious result if the series that generated the results are non-stationary. This is why we investigated the time series properties of the data by conducting unit root test for stationarity using ADF method. The results are presented on table 4.1 below.

Table 4.1: Augmented Dickey-Fuller (ADF) unit root test.

Series	ADF test statistics	5%critical value	1% critical value	Order of integration
GDP	**5.972531**	**-1.958**	**-2.682**	**I (1)**
CBL	**-2.875370**	**-1.958**	**-2.682**	**I (1)**
INT	**4.873225**	**-1.958**	**-2.682**	**I (1)**
GEA	**3.019231**	**-1.958**	**-2.682**	**I (1)**

Source: Authors computation, 2021 using E-view 10.0 version,

The result of unit root test shown on table4.1 above indicated that all the included variables in the model were integrated of same order, that is, I(1), see column 5.

Table 4.2: Philips Perron (pp) Unit root test results

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Series	PP test stat.	5% critical value	1% critical value	Order of integration
GDP	**-4.3221130**	**-1.958**	**-2.682**	**I (1)**
CBL	**-5.64972**	**-1.958**	**-2.682**	**I (1)**
INT	**-8.408963**	**-1.958**	**-2.682**	**I (1)**
GEA	**-4.328721**	**-1.958**	**-2.682**	**I (1)**

Source:Authors computation, 2021 using E-view 10.0 version.

The Phillips Perron, PP test in table4.2 also showed that the variables are integrated of order I(1). This implies that the variables are all stationary and co-integrated.

Table 4.3: Johansen co-integration test

No. of CE (S)	Eigen value	Trace stat.	5% critical value	Prob **
None	**0.089956**	**310.7792**	**96.57388**	**0.0000**
At most 1	**0.993051**	**182.0231**	**70.31420**	**0.0000**
At most 2	**0.989375**	**99.1989**	**48.56820**	**0.0000**
At most 3	**0.786336**	**56.0023**	**28.978081**	**0.0000**

Source: Authors computation, 2021 using E-view 10.0 version,

An examination of table 4.3 showed that the Eigen value statistics shows existence of four unique co-integrating equations between the variables, GDP, CBL, INT and GEA at 5 percent level. Thus, it can be concluded that there is long-run relationship between rice output and bank credits in Nigeria during the 1985-2018.

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Table4.4: Ordinary least square parsimonious (ECM) results (Dependent variable): D (GDP).

Variables	**Coefficient**	**t-stat.**	**Prob.**	**5% critical value**
Constant (C)	**2230.12**	**4.8252**	**0.0049**	**2.042**
D (CBL)	**423.4331**	**4.51828**	**0.5314**	**2.042**
D (INT)	**-98.6528**	**-0.84750**	**0.4063**	**2.042**
D (GEA)	**6.7677**	**4.18821**	**0.5929**	**2.042**
ECM (-1)	**-0.82831**	**-4.99231**	**0.0000**	**2.042**
R-square	**0.6013521**			
R-square (adjusted)	**0.589925**			
F-stat.	**5.821103**			
Akaike info criteria	**23.68952**			
Durbin-Watson stat.	**1.152284**			

Source:Authors computation, 2021 using E-view 10.0 version

In view of the result from table 3, and in order to absolve the short-term dynamics of the relationship among the variables an Error correction model (ECM) was used (see table4.4). The results in the table indicate that the coefficient of ECM test shows a negative. This was expected. The result also showed that while variables such as: CBL and GEA have positive impact on GDP, INT has negative impact on it.

Furthermore, the coefficient of ECM which is -0.82831 implies that the system corrects itself to previous period disequilibrium at a speed of 82.83% annually, meaning that the speed of adjustment to disequilibrium is 83% approximately. This further underscore the long-run equilibrium relationship between the variables.

Consequently, this study concludes that agricultural output can be said to be positively determined by changes in CBC and PEX with the exception of INT that has negative effect. These findings are consistent with the findings of Kemboi and Tarus, (2012) and Peter and Lyndon (2015). The coefficient of multiple determination, R^2 = 60.13% indicates that the included explanatory variables accounted for about 60 percent of the changes in GDP. This means that the regression model has a good fit. Besides, the small value of Durbin-Watson statistic (1.15) implies that there is absence of first order autocorrelation.

5. Summary, Conclusion And Recommendations

This study investigated the effect of determinants of foreign exchange rate on economic growth in Nigeria during the 1985-2018. Time series data on agricultural output, bank total loans, to the economy,

interest rate, and government expenditure on agriculture were collected from various sources and used for the estimation. The major findings are summarized below:

i) It was found that commercial bank credits have positive effect on agricultural output t in Nigeria.

ii) It was found that banks' interest rate has negative effect on agricultural output in Nigeria.

iii) It was also found that government expenditure has positive effect on agricultural output in Nigeria.

This study empirically examined the effect of bank credits on rice output in Nigeria during the 1985-2018. The study investigated both the short-run and long-run relationship between the variables by using Johansen co-integration and Error correction model. From the analysis of the results, it can be concluded that while commercial bank credits and government expenditure have positive effect on agricultural output, while banks' interest rate has negative impact on it.

Based on the findings of this study, the following recommendations are made:

(i) Nigeria government should adopt policies that will lead to increase in money supply in the economy. To achieve this, the banking sector should be encouraged to increase lending to the private sector (particularly those who are engaged in agricultural productive activities).

(ii) Government should also increase its expenditure on agricultural production. To this end, more should be given to genuine farmers to enhance their production

(iii) Government should make efforts to stabilize banks' interest rate, or even reduce it. This will encourage producers to take more credits for productive activities.

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Determinants of Healthcare Expenditure among Households in Nigeria

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Abstract

The optimal goal of any economy is to provide accessible, quality and an uncompromising healthcare system. While trying to achieve this goal, the health system should be such that it ensures households are insured against adverse consequences of healthcare expenditure. In Nigeria, the primary means of funding healthcare is out-of-pocket. The consequences of out-of-pocket (OOP) healthcare expenditure on household's state of economic can be alarming and catastrophic, especially on low income earning households and those lacking healthcare insurance scheme.

Poor households can be further pushed into penury, they may cut down on the consumption of essential items such as food and clothing, and may abstain from medical care, thus perpetuating the cycle of illness and disability. The study finds it crucial to investigate and understand why household is still the major financier of healthcare service in Nigeria.

The Grossman (1972) human capital theory provided the theoretical framework for the study. Data was obtained from the Harmonized Nigeria Living Standards Survey (HNLSS), 2010, produced by the National Bureau of Statistics. The HNLSS covered 77,400 households across the six geopolitical zones. A logit model was estimated to examine the determinants of healthcare expenditure in Nigeria.

The findings reveal that increase in household age, and education is positively associated with demand for healthcare. Household size, female-headed household, urban household, religion and agricultural workers negatively affects demand for healthcare.

Emphasis on measures geared towards providing financial support to reduce the burden of healthcare spending among households should be intensified by the government.

Keywords: HealthcareExpenditure, Household

Introduction

Health determines the state of wellbeing of individuals in the society and is essential for the productivity of any nation, therefore, a necessity in the quest for development that can be sustain overtime (Olaniyan, Onisanwa, & Oyinlola, 2013). While health is a necessity in the attainment of economic development, it is a product of aggregate performance of an economy at a given time. The interlink between health and sustained economic development is obvious, thus, to raise the quality of life and ensures increase productivity, adequate provision and access

to preventive, curative and affordable health system must be provided (World Health Organization (WHO), 2018).

People with good state of health tend to be more productive in carrying out economic activities thereby attracting higher remuneration, they tend to abstain less from work owing to injury or sickness, and such workers have more work hours as well as participate in the labour force for a longer duration than individuals with poor health status. Healthy people attain higher educational qualification through increasing scholastic performance that aids productivity, attracts higher income, raises the capacity to save and facilitates investment (Bayati, Akbarian, & Kavosi, 2013; Onisanwa& Olaniyan, 2019). The more the savings, the more the fund available for investment, thereby facilitating growth and development of the economy. The rising growth rate in the economy of some developing countries has been attributed to improvement in the life expectancy at birth (Miladinov, 2020).

The optimal goal of any economy is to provide accessible, quality and an uncompromising healthcare system. While trying to achieve this goal, the health system should be such that it ensures households are insured against adverse consequences of healthcare expenditure (Amaghionyeodiwe, 2009; Elgazzar et al., 2010). In most developing countries, such as Nigeria, the main source of funding healthcare is out-of-pocket. The consequences of out-of-pocket (OOP) healthcare expenditure on household's state of economic can be alarming and catastrophic, especially on low income earning households and those lacking healthcare insurance scheme (Nyman& Trenz, 2016; Aregbeshola& Khan, 2018).

The OOP spending can be catastrophic if it takes a large share of the household's income, hence, the consequence could be adverse. For instance, poor households can be further push into penury due to direct private payment for health service, households may cut down on the consumption of essential items such as food and clothing (Onisanwa& Olaniyan, 2019). Also, households sometimes may not seek medical care rather than to confront the consequences of healthcare spending, thereby perpetuating the cycle of illness, disability, and poverty (Kimani, 2014).

Out-of-pocket (OOP) payment for health at point of service is viewed by many as a system of funding healthcare that lacks equity, because it impose an unequal adverse economic cost on different social class, particularly the low income households and the elderly (Kimani, 2014). Under such condition, household will bear the financial burden and when the medical bills outweighs the capacity to pay at the point of need, it can prevent individual or household from seeking healthcare at the appropriate time or even gives rise to complete avoidance of healthcare. Consequently, low-income household are often compelled to ration scarce resources among basic necessity of life.

A major concern in funding healthcare via out-of-pocket is the economic burden of such spending on household welfare overtime (Akhigbemidu,2017). This view is premised on the unpredictability of OOP payment; the size of the OOP expenditure when weigh against household resources and the unseasonal frequency in relation to

income. Given the absence of egalitarian system of income distribution and high prevalence of poverty in Nigeria, low-income household tend to be adversely affected.

Under-utilization of healthcare resources is another issue bedeviling the developing world. It is imperative to understand the factors which determines the utilization of healthcare resources by household, in order to attain the goal of adequate access to healthcare. Therefore, policymakers in pursuit of health care for all citizens must promote policy that helps alleviate the burden of OOP spending, in order to improve human wellbeing.

A vital role of government at all levels in any economy is to ensure that it reduces the burden of high household healthcare expenditure. However, in Nigeria, budgetary allocation to the health sector is apparently inadequate, thereby leading to poor health condition and households tend to incur direct medical expenditure, thus limiting access to medical facilities by the highly susceptible low-income individuals and households (Olasehinde& Olaniyan, 2017). This partly explains the reason behind the sluggish achievement of the desired target of the Sustainable Development Goals (SDGs), and the poor implementation of the National Health Insurance Scheme (NHIS) among others.

Meanwhile, the factors that determines the usage or otherwise of health services are numerous and vary among households. Such decisions are influenced by the purchasing ability of the consumer, the cost of the health care and the opportunity cost between cost of medical care and household non-medical expenditure (Su, Pokhrel, Gbangou, &Flessa, 2006; Ebaidalla & Ali, 2019). However, there is no consensus as to what inform the choice of healthcare service and the degree to which the factor influenced the demand for healthcare. Hence, it is imperative to consider and carry-out empirical investigation on what determines household healthcare spending. Findings that emanate from such research can help in the pursuit of health care utilization for all.

The study finds it crucial to investigate and understand why household is still the major financier of healthcare service in Nigeria in spite the existence of a formal health insurance. Specifically, the study examines the socio-economic and demographic factors that influence demand for healthcare in Nigeria. Factors such as size of household, income, age of household head, and gender of household head are analyzed. Others are marital status, education level and religion of the household's head. The study focused on these healthcare factors because they are the main factors that influences demands for healthcare in Nigeria, based on reviewed literature.

The study contributes to literature on the determinants of healthcare expenditure among household in Nigeria by investigating the factors that influence the demand for healthcare at the micro level, specifically on household. It is necessary to take into consideration where bond in family union is stronger and the ratio of dependent population highest in an attempt to analyze utilization of healthcare in Nigeria, therefore, the need to study the determinants of healthcare expenditure at household level. Using Household Survey

data, the analysis is conducted at national level.

Methodologically, many studies (Amakom & Ezenekwe, 2012; Omotoso, 2014; Latunji& Akinyemi, 2018) on the determinants of healthcare expenditure are state-based analysis and limited to those who reported illness or injury, hence not a good yardstick for measuring determinant of healthcare for the Nigerian population. This study make use of General Household Survey (GHS) data that have socio-economic and geographical household's characteristics, and with a national coverage.

Furthermore, several studies (Olaniyan &Lawanson, 2010; Imoughel& Ismaila, 2013) on the determinants of household healthcare expenditure were carried out on a macro scale. While only few (Oyinpreye& Moses, 2014) have attempted to investigate determinants of healthcare at a micro level. Also, some studies (Adisa, 2015; Adam &Aigbokhaode, 2018) investigate the phenomena in Nigeria on a regional perspective. This study however seeks to bridge the identified gaps by investigating the determinants of healthcare expenditure by household at the national level using the 2010 (HNLSS) data. In order to achieve effective and efficient management of the health care system, it is important that policy makers are informed on the determinants of household healthcare expenditure in order to achieve effective and efficient management of the health care system in developing economies like Nigeria.

This study is structured into five sections, following the introduction is section two that provides a review of relevant literatures. The third section focuses on the research methodology and theoretical framework. Section four involves the presentation, interpretation and discussion of results. Lastly, section five, summarizes, concludes and gives policy recommendations.

Literature Review

Evidence of determinants of healthcare abounds in literature for low-income and high-income countries, however, there is limited studies on the determinants of healthcare expenditure among households in Nigeria with national coverage.

The studies of the determinants of healthcare generally relies on the Grossman (1972). The theory states that demand for healthcare is a derived demand. That is, people demanded for healthcare to have good health in return. The demand for healthcare is an input that helps mitigate the depreciation effect of health stock overtime.

According to Grossman, (1972), the demand for health is a demand for consumption of commodity that goes into individual's utility function, as well as an investment commodity that possess the capacity to raise the stream of healthy days/time. The model further outlines factors such as exercise, education, age and wage rate as the major determinants of demand for healthcare.

Another model that explains the usage of health care is the behavioural model (Andersen, 1995). The model is a conceptual model that demonstrates the determinants of health care consumption among individuals. According to the behavioural model, people's usage of

health service is as a result of three main factors, namely predisposing features, enabling facilities, and need. The predisposing characteristics are the sociocultural features of the people before the advent of illness. This is built on the notion that household's desire to demand for health service is a function of collection of demographic factors, social structure and their belief about the state of health, prior the sickness or injury.

According to Puteh & Almualm (2017) OOP is a regressive forms of healthcare financing that is not efficient and lacks equity. Meanwhile, it is the main source of funding medical care in low-income countries. OOP can be direct or indirect cost. Direct costs in the sense that they are associated with hospital bills for consultation, tests and medications. While the indirect costs include loss of income due to absenteeism from work associated with illness, transportation to health facilities, and cost of living of the caregivers.

Wellay*et al*. (2018) argued that both demand-side barriers and supply factors influenced the demand for health care services in Ethiopia. They found that severity of illness, having educated household head, distance of health facility from home, treatment quality, and cost of medication were the main determinants of health care.

Elgazzar et al. (2010) examined the economic consequences of out-of-pocket spending in some selected Middle East and North Africa (MENA) countries and found that OOP reduced the living standard in the region, with prevailing economic condition being the main determinant of demand for healthcare. Similarly, Kimani et al. (2016) concluded that economic poverty level among households in Kenya determined healthcare utilization, which is often catastrophic in nature.

Okunade et al. (2009) found that healthcare spending in Thailand is a function of household's permanent income and size of the household. Magazzino& Mele (2012) examined the determinants of health care expenditure in some selected regions in Italy. The study found that the level of unemployment, degree of urbanization, available beds in the hospitals, and the level of literacy had a significant impact on health care. In Burkina Faso, Su, Pokhrel, Gbangou, &Flessa(2006) individual opinion with respect to the illness, household influence, nature of the illness, and the choice of service providers. Others are price of health service, the household's earnings, as well as the opportunity cost of medical spending. Ke, Saksena, & Holly (2011) found that per capital income, foreign aid, population structure, pattern of the illness, and characteristic of the health system were the main factors that influence demands for health services in developing countries.

Mondal, Kanjilal, Peters, & Lucas (2010) investigate the determining factors of catastrophic health care spending and found that frequency of illness within a household, severity of the illness, history of chronic morbidity in the household, household size, and location either rural or urban influenced health spending in India. Babikir, A., Satty & Mwambi (2018) observed that out-of-pocket expenditure in South African is determines by the level of poverty, hospital bills, and medical supplies

Rous & Hotchkiss (2003) found that individual characteristics (education, age, and gender), household characteristics (good toilet, house size, income per capital, garbage disposal, good house), and community characteristics (urban, mountain or hills), as well as household head characteristics (age, education, and gender) influence household health care expenditure in Nepal. In Sudan, household's earnings, household size, household members above 65 years of age, and the highest level of education attainment of household's head are the main determinants of out-of-pocket health spending and catastrophic medical spending (Ebaidalla, 2019).

In Nigeria, Aregbeshola& Khan (2018) identified socioeconomic and demographic factors as the forces responsible for rising catastrophic health expenditure in Nigeria. Using a double-hurdle model with dependent errors, Riman & Akpan (2012) identified the spatial distribution of health facilities as a factor that influence health seeking behavior of household. Aregbeshola& Khan (2020) examined the determinants of out-of-pocket expenditure in Nigeria, found that educational attainment of household's head, large household size, employed household's head, households in South East region of Nigeria, using government owned hospital/clinic, and households that report chronic illness are the main determinants of out-of-pocket spending. Oluwatimilehin (2014) revealed that level of education and place of residence are the main factors that account for household demand for health care in Kenya.

Olasehinde& Olaniyan (2017) investigate the factors responsible for health spending in Nigeria using household level data. The study reveals that house size, income and gender of household head significantly affect health expenditure in Nigeria. Also, marital status and employment type influence both rural and urban households demand for health care.

In a similar study, Adam &Aigbokhaode (2018) found that level of income, education attainment, and marital status of household's head are the major predictors of demand for healthcare among households. Latunji& Akinyemi (2018) found that health seeking behavior among public workers in Ibadan is influenced by affordability, efficient service delivery, closeness to healthcare facilities, and availability of essential drugs are the factors that informed choice of health services.

Ibukun & Komolafe (2018) found that level of income, employment status, residential area, and the choice of medical facility are the determinants of catastrophic health expenditure in Nigeria. Also, Olaoye (2019) found that consultation fees, size of household, medicine and health insurance, as well as number of days admitted in the hospital are the major determinants of healthcare expenditure in Nigeria.

Methodology

This study is anchored on the theory of planned consumer behavior as developed by (Ajzen, 1985, 1991, 2005, 2012). The theory focused on the specific consumer behavior of interest as against the overall utility of a product. In this study, the theory proceed as follows: consider a household that wants to maximize utility by choosing

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whether to seek health care or ignore treatment, subject to resource constraints. The preference for health facility, (1) over non-treatment, (0) implies $u_1 \text{ f } u_0$. That is, households would always choose treatment over non-treatment in the face of illness or any other health challenges. This research employed the binary Logistic Regression model of the form

$$\Pr(Y = 1 | X) = G(X\beta) \quad (1)$$

in determining the determinants of demand for healthcare expenditure in Nigeria.

Equation 1, express the conditional probabilities of $Y = 1$ (household seeking health care) given elements of vector X. X is the vector of the independent variables that determines the demand for health (see Table 1 for description of variables). It can further implies, the utility household derives from seeking health care in the face of illness is higher than abstaining from treatment. The probability function of seeking treatment in the face of illness is specified as

$$\lambda(X\beta) = \frac{\exp(X\beta)}{1 + \exp(X\beta)} \quad (2)$$

Equation 2 is the cumulative (logistic) distribution function (cdf). It values ranges between zero and one. λ is a non-linear function of $X\beta$, which implies it cannot be estimated using the ordinary least square (OLS). The model will be estimated using the Maximum Likelihood estimator because the error follows a standard logistic distribution.

Data

This paper utilizes the Harmonized Nigeria Living Standards Survey (HNLSS), a cross-sectional data set collected by National Bureau of Statistics (NBS) in 2010. It is an abridged survey that serves as a follow up to both the Core Welfare Indicator Questionnaire Survey (CWIQ 2006) and the Nigeria Living Standard Survey (NLSS 2004). This is a secondary data that captures household characteristics that include socio-economic, demographic and geographical distribution of households.

4. Presentation and Discussion of Results

This section provides the descriptive statistics of the variables used in the study and estimates of logit regression analysis.

Table 1: Descriptive Statistics of Members in the Model

VARIABLES	DESCRIPTION	PERCENTAGE
Dependent variable		
Demand for health		8%
Explanatory variables		
Age	Age of expressed log of years	6%
Household size		

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Sex of head of household		
Female	=1 if female, 0 otherwise	46%
Place of residence		
Urban	=1 if urban resident, 0 otherwise	37%
Marital status	=1 if monogamous, 0 otherwise	28%
Monogamous		
Polygamous	=1 if polygamous, 0 otherwise	44%
Religion		
Christian	=1 if Christians, 0 otherwise	43%
Muslim	=1 if muslim, 0 otherwise	57%
Education		
Primary	=1 if primary education, 0 otherwise	31%
Secondary	=1 if secondary education, 0 otherwise	16%
Post-secondary	=1 if post-secondary education, 0 otherwise	5%
Employment		
Self-employed	=1 if self-employment., 0 otherwise	64%
Paid-employed	=1 if paid-employment., 0 otherwise	7%
Self employed (non-agric)	=1 if self-non-agric., 0 otherwise	12%

4.1 Determinants of Household Healthcare Expenditure in Nigeria

Table 2 shows the likelihood ratio (LR) statistics and the predicted probability of positive outcome for each level of analysis. The predicted probability is the predicted outcome for binary variables defined as 0 to1. The difference between the predicted outcome and actual outcome is used to explain the overall model performance. This difference is related to the concept of

goodness of fit of a model such that models with good fit indicate smaller differences between the predicted and observed outcomes**.**

The findings show the extent to which socioeconomic variables included in the regression analysis affect the probability of demanding for health care in Nigeria.

Table 2: Results of Odds Ratio, Logistic Coefficient and Marginal Effect

VARIABLES	odd ratios	logit coefficient	marginal effect
demand_health	(dependent variable)		
Age	4.064***	1.402***	0.0628***
	(0.0573)	(0.0141)	(0.000563)
hh-size	0.0662***	-2.715***	-0.122***
	(0.00174)	(0.0263)	(0.00106)
Female headed hh	0.0264***	-3.634***	-0.163***
	(0.000943)	(0.0357)	(0.00135)
Urban	0.0972***	-2.331***	-0.104***
	(0.00386)	(0.0397)	(0.00169)
Monogamous	71.05***	4.263***	0.191***
	(4.010)	(0.0564)	(0.00239)
Polygamous	0.00731***	-4.918***	-0.220***
	(0.000510)	(0.0697)	(0.00292)
Christainity	0.000105***	-9.157***	-0.410***
	(0.000142)	(1.342)	(0.0600)
Muslim	0.0155***	-4.165***	-0.186***
	(0.0208)	(1.340)	(0.0600)
Primary	0.976	-0.0240	-0.00108
	(0.0196)	(0.0201)	(0.000900)
Secondary	1.108***	0.103***	0.00461***
	(0.0277)	(0.0250)	(0.00112)
post_secondary	1.167***	0.155***	0.00692***
	(0.0477)	(0.0409)	(0.00183)
self_employ	0.0114***	-4.470***	-0.200***
	(0.000710)	(0.0621)	(0.00265)
paid_employment	464.4***	6.141***	0.275***
	(35.69)	(0.0768)	(0.00309)
Self-agric_nonagric	0.00365***	-5.612***	-0.251***

	(0.000259)	(0.0708)	(0.00298)
Constant	40.75***	3.707***	
	(54.68)	(1.342)	
Observations	294,564	294,564	294,564

*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' computation

4.2 Interpretation of the Marginal and Odd Ratio

This study empirically examines the determinants of household healthcare expenditure in Nigeria using HNLSS. Logistic model was employed to estimate factors that influence demand for healthcare by household, the study reported the marginal effects of Logit regression. The identified variables in the study include socio-economic characteristics of household like age, household size, household headed by female; geographical distribution of household (urban); marital characteristics (monogamy and polygamy) of household; religion (Islam and Christianity), highest education level of household (primary, secondary and post-secondary), and occupation type.

There was a statistically significant relationship between healthcare expenditure and the age of household as well as household size. Increase in age within the household increases the likelihood of demanding for healthcare, this is because as people advance in age, the chances of them facing health challenges tend to rise as such an increase in the need for healthcare. The result corroborates the findings of Aregbeshola& Khan (2018) that found a positive relationship between age of household members and catastrophic health spending. Meanwhile, there was a negative statistical relationship between healthcare expenditure and household size. This result makes sense in Nigeria context in that, large household size is a common feature of locations with high incidence of poverty. Poverty constraint the capability of household to demand for health services. This result is in line with the work of Okunade et al. (2009) that reported a negative association between healthcare spending and family size in Thailand, however, it contradicts the finding of Olasehinde& Olaniyan (2017) that, found a positive and significant effect between healthcare and log of household size. The finding also reveals that, female headed household reduced the probability of spending on healthcare. This implies male headed household raises the chance of incurring more healthcare expenditure than household with female head. This does not corroborate the result of Aregbesola et al. (2009) that found a no significant relationship between male household head and rising demand for healthcare.

Result for place of residence shows that for an increase in the number of urban households, the likelihood of demanding for healthcare reduces. This can be attributed to the classification of households into urban and rural in Nigeria,

with the majority being classified as rural dwellers.

The result further reveled that, households' religious beliefs play an important role in explaining demand for healthcare in Nigeria. Christians and Muslims are significantly less likely to spend more on healthcare than those in the traditional belief.

Findings from the study further suggest that having higher educational attainment did not necessarily reduce the probability of household seeking healthcare in Nigeria. Similarly, having secondary education is significantly more likely to raise spending on healthcare relative to households without As a matter of fact the higher the level of education attainment the more the likelihood of seeking for healthcare. The findings suggest that education significantly influence demand for healthcare in Nigeria, this is because the higher the level of education the more inform the people are about the need to seek formal healthcare, and also, education tends to influence the income earning ability of household, thereby raising the chances of more educated household to finance healthcare.

Occupation types show differential effects on household healthcare spending, the employment statistics show that more Nigerian are self-employed relative to those in the paid employment. The findings further show that, households in the paid employment are more likely to spend on healthcare than those household that are self-employed.

Summary, Conclusion and Recommendations

This study employed logistic model to investigate the determinants of household healthcare expenditure in Nigeria. The findings reveal that increase in household age is positively and significantly associated with demand for healthcare. Also, explanatory variables like household size, female-headed household, urban household, religion (Islam and Christianity) negatively affects demand for healthcare. Education level of household is found to be positively associated with demand for healthcare resources even though households with only primary school attainment proves negative and significant compared to households with secondary and post-secondary school attainment. There exists a mix finding related to income of household. Household on self-employed in agric and non-agric prove negative and significant compared to household on paid employment. The empirical findings of this study tallied with some other studies (Olasehinde and Olaniyan, 2017; Su et al. 2006; Oluwatoyin et al. 2015, Wellay et al. 2018).

The empirical findings in this study suggest diverse policy implications for policy-making in Nigeria. This will offer pragmatic solution to excessive healthcare expenditure and enhance generally the welfare of individuals and households. There should be a form of social healthcare protection for aged household so as to reduce the burden of healthcare expenditure given that medical spending rises with age. Also, rural households tends to be more vulnerable to illness and disability compares to urban households. This tends to suggests that rural households have preference for healthcare if given the

resources. Hence, policy makers must do the needful to ensure equitable distribution of health facilities and reduce costs associated with seeking healthcare in the rural area.

Furthermore, there is need for adequate provision, sensitization and orientation of households on the importance of education, this will help mitigate the occurrence and spread of some diseases and ailments.

Certain number of gaps traced to data constraint of the HNLSS exists in this study. Ethnic and tribal variable can be included in studies relating to health. This is left out in the study due to difficulty in its measurement. Scope of healthcare expenditure can extend to preventive and rehabilitative care in addition to curative care, as well as other forms of healthcare services. Further studies can also be carried out in Nigeria considering the distribution of the country into six geo-political zones all with different healthcare seeking behavior.

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Reunification of the Korean Peninsula: Matters Arising

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Abstract

The study examines the prospect and challenges of the reunification of the Korean Peninsula. Before the last fifty years, the Korean Peninsula was recognized as a unified and autonomous city whose citizens have enjoyed decades of historical and economic ties until foreign influence now divided them along ideological leaning. The ideological rivalry between the United State and the Former Soviet have played a significant role in entrenching the division. The paper attempt a SWOT examination of the possibilities of the reunification and how this can be attained with minimal effort from both of the divide. Data were gathered mainly from secondary sources and a conflict approach/variant of the regional integration theory was adopted to underpin the study. Findings indicate that foreign influence have been the major factor in creating and sustaining the division between the North and South, and that the economic sanction on the North Korea if not lifted by the US can mar the reunification efforts. Considering the development and market integration experiences by other South East Asian countries like Singapore, China Malaysia and Taiwan, there is hope that former Korean Peninsula will achieve total reunification and economic integration. The study recommends amongst others the need for US and China to reduce its overbearing influence in the region and allow both government (North & South) to take their destinies into their hands.

Key words: Korean Peninsula, Reunification

Introduction

Korea, or the Korean Peninsula, is a region in East Asia. Since 1945 it has been divided into the two parts which soon became the two sovereign states: North Korea (officially the Democratic People's Republic of Korea) and South Korea (officially the Republic of Korea). Korea consists of the Korean Peninsula, Jeju Island, and several minor islands near the peninsula. It is bordered by China to the northwest and Russia to the northeast. It is separated from Japan to the east by the Korea Strait and the Sea of Japan.

The common saying that no nation can exist/operate economic autarky is a common place in that interdependency becomes inevitable if nations must respond to the globalism and take advantages inherent in it. The needs for interdependency have become imperative as it is the surest way for nations to catch up with the technologically advanced nations especially in the areas of real development. This interdependency could cut across economic, security, health and socio-

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cultural (Van Ginkel & Vanlangenhove, 2003).

The fall of the berlin wall and subsequent disintegration of the former Soviet Union have proven the fact that no single politico-economic principle is capable of providing a nation with the requisite of development. In other words, neither capitalism nor socialism is strictly sufficient to answer the development requirement of a nation. Each of these principles has its inherent contradictions, it takes courageous leaders to identify the salient attributes of both and domesticate them by putting into cognizance the historical realities and developmental needs of their respective countries.

More so, the Hiroshima and Nagasaki bombing is still fresh in the memories of leaders and the few who witnessed it. The fallout of this crisis have left an indelible mark in world history not because of the lethality of the weapons used but the attendant humanitarian crisis it brought to the fore. Perhaps, the consequences of WW II was what necessitated nations to sign non-aggressive pacts and the discouragement of the use of lethal weapons no matter the provocation.

Literature Review

During the Yi dynasty, the Korean Peninsula practiced Confucianism and this have lasted for centuries until Christian evangelism led by the United State Missionaries. The wake of the end of World War II and the subsequent emergence of unipolar global order made US to assume the position of global hegemon. The cold war period marked the beginning of non-violent hostilities between US and Russia occasioned by ideological rivalry and the quest by both countries to acquire allies. While US is promoting capitalism and democracy, Russia promoted socialism and communism.

Youngseop (2021) took a cursory examination of the role of the Bible in the divided Korean Peninsula where imperialism and American churches play a vital role in complicating the relationship between the two regions. He looked at the relationship between the church and the state (especially American churches) and how this have impacted on the relations between the two hitherto unified communities. This entails that the American churches were not left behind in the campaign for allies. By implication,, churches in the Peninsula (south) that yielded to the call by American Churches are likely those to be supported and promoted.

Dalton (2020) considered the need for the Korean Peninsula to transcend politics of deterrence and attained cooperative security where he submits that the North Korea should necessarily abandon its nuclear proliferation program in the interest of peace regime and denuclearization which still constitute a major challenge to US-DPKR negotiators. The fear of Kim Jong-un is the fact that playing in to the hands of the US by accepting to suspend its nuclear programe may likely lead to an internal upraising that will inspire a regime change. And for the DPKR, its nuclear program is the only way out because no nation will contemplate any form of aggressive behavior towards it. It further suggest that the US have exhausted all tactics and maneuvers to compel the DPKR

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to sheathe its sword by embracing denuclearization and peaceful regime in the Peninsula.

Skylar (2018) argued on the possibility of Chinese army assisting the US in securing the DPKR nuclear arsenal should crisis broke out between the North and South Korea. What this portends to the effort of denuclearization and peaceful regime in the Peninsular is that US can be disparate in its campaign to cooperate or sign a pact with China to force a regime change in the DPRK and by extension, halt the nuclear proliferation in the region.

It is instructive to note at this juncture that the US must learn from it experiences in Afghanistern, Iraq and recently Libya. The world had suffered enough of this kind of desperation to acquire resources and control through domination and use of gun barrel to subdue innocent and peace seeking people. The action of the US is a recipe for chaos and lawlessness in the region which will push human kind to extinction.

It is obvious that extant literatures on the subject matter have portrayed the DPKR as a deviant nation that must be halted by any means. Forgetting that God created man and made him free. North Korea decided to take its destiny into it hands and beside, the united nation chatter holds that all nation must be allowed to decide the nature of political system it deem fit to practice and in no circumstance should a relatively bigger nation lord it over the weaker ones.

Theoretical Framework

There are numerous theories that can be used to underpin studies of this nature. However, out of these theories, the conflict variant of regional integration theories is selected to underpin the study. The conflict approach to regional integration was popularized by Haas (1971) when he claimed that the major aim of regional integration is acquire new techniques for resolving conflict among the integrating partners.In the process, there is need to calm down national pride, rights and sovereignty to achieve this goal. In the process of acquiring these new techniques, according to Haas (1971), nation-state need to "mingle merge and mix with their neighbors" voluntarily to finding a common ground to put a stop to hostilities. It is notable from the above arguments that, the purpose of regional integration is to end year or decades of hostilities by nations and states coming together. This can also be exemplified in the 'Paris Peace Conference' or what is popularly called the Versailles Treaty of 1919, which brought the First World Warto an end (Ghali and Nwokedi, 2016). This was meant to serve as a vital step in European integration, but the Paris Peace Conference severely punished Germany and the Germans felt greatly wounded.

To link the theoretical framework with the topic under review thus; both the North and South were formerly under the Korean Peninsula until 1948 when they were divided. Today, their relationship is hall marked by hostilities, tension and suspicion. The conflict approach holds that voluntary interaction and lowering of national pride and sovereignty will herald a new down of integration between the North and South without necessarily infringing/intruding on each other's

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political and economic leaning. To this end, leaders of both nations should transcend the current hostilities and work on a common ground that will allow free flow of goods and people across the divide to foster cooperation, peace and integration.

The Reunification of the Korean Peninsula: Prospects and Challenges.

The reunification of the Korean Peninsula have over the years preoccupied the mind of scholars and analyst especially on the need to have a common ground for both countries (North & South) to relate and mingle in order to foster regional integration/unification.One of the prospects of the reunification of the Korean Peninsula is that both countries have attained a high level technologies that could be transformed into producing high tech machines and equipment that would make work easy and contribute to the GDP of both countries. The nuclear technologies for instance can be redirected into the production of stable and high voltage electricity to power industries and other sub-sectors of the economies of both countries. This will allow for the massive production of goods and services for local and international consumption. Also, space exploration is another important area which if properly explored will help mitigate the challenge posed by climate change through early warning signals and adequate budgetary plans to arrest any catastrophe by both governments.

The North and South Korea have over the year's attained reputation in the production and marketing of computer soft and hard-ware. The reunification of both countries will not only make the region a hub of economic activities, it will further boost their confidence on the need to integrate in the interest of peace and stability. To this end, arms race and stockpiling of weapons will no longer gain currency and shall be replaced with vigorous economic activities for the mutual benefits of the reuniting/reintegrating partners.

Nuclear technologies could be used in creating sophisticated medical instruments that could help medical diagnosis and identification of ailment treatment. The attainment of the above will make the region most sought after in the treatment of both tropical and contemporary medical conditions around the world. Agriculture is also not left out as many agricultural workers around the world used radiation to stop the reproduction of insect that hamper the growth and development of crops leading to bumper harvest for food security.

Challenges

Dalton (2020) identified a number of "vexing" issues that needs urgent solution for the reunification to be attained.

1. The role of Joint US- South Korea's stationed in Republic of Korea (ROK)
2. The status of US extended deterrence to South Korea and Japan.
3. Disposition of the Democratic People's Republic (DPKR) suspected chemical and biological weapons and ballistic missiles inventory.
4. Other North Korean behavior that contravenes international norm and standard.

The US joint mission in South Korea is not only seen as a threat to the reunification of the Korean Peninsula, it further heightentension and the possibilities of the use of lethal weapons in the event of any escalation of crisis. This singular act of the US stationing a military mission in South Korea made pundits and scholars to believe that it a preparatory military strategy to respond to any eventuality in the region. The US have in its interest of expanding its geo-political stronghold extended its deterrence from South Korea to Japan with a view of gathering intelligence to demonstrate its might.

The dispositions of the DPKR especially in its uranium nuclear enrichment programs coupled with other behaviors like testing the lethality of missiles and refusal to cooperate with the UN atomic nuclear experts to respond to calls for denuclearization have created a huge vacuum with the resultant effect of refusal by the DPKR leaders to take heed. The irony of the whole matter is the fact that the US is trying to use its influences to prevail on the UN to compel the DPKR to suspend its nuclear program. The question that should preoccupy a discernible mind is; Does the US who often time boost of its weapons stockpile have a moral stand to insist that other nation must be prevented from acquiring one?

In June 2018, tensions between the United States and North Korea were at least temporarily ameliorated when Trump and Kim held a summit meeting in Singapore. The summit raised hopes that the United States and North Korea would avoid steps that could lead to war and that the North Korean nuclear threat would be resolved through further negotiations. This entails that the age long hostilities will soon come to an end and peace will be returned to the Peninsula. The two leaders seemed to establish a personal rapport. They also signed a joint statement that committed North Korea to “work toward complete denuclearization of the Korean Peninsula” and pledged joint efforts to “build a lasting and stable peace regime on the Korean Peninsula (Skylar, 2018).

In the aftermath of the Trump-Kim summit, however, North Korea's actions raised doubts about its willingness to eliminate its nuclear weapons and ballistic missiles. Although North Korea apparently had demolished its nuclear test site in May 2018 and began dismantling a missile-engine test site in July 2018, reports from the U.S. intelligence community and independent observers suggested that Pyongyang was continuing to build intercontinental ballistic missiles and was preparing to conceal its nuclear assets and activities (Dalton, 2020).

Moreover, the post-summit diplomatic interactions between the United States and North Korea suggested that even if there were progress toward the elimination of North Korea's nuclear weapons, it might be far less rapid and complete than the United States had hoped. After former U.S. Secretary of State Mike Pompeo held two days of reportedly fruitless talks in Pyongyang in July 2018, North Korea denounced the United States for making a “unilateral and gangster-like demand for denuclearization. In August 2018, the North Korean foreign minister privately accused the United States of retreating from the agreement that had been reached at the Trump-Kim summit.

The uncertain progress of U.S -North Korean negotiations and disturbing signs of activity from North Korea's nuclear complex suggest that Pyongyang has no plans to give up its nuclear arsenal. Even if the United States and North Korea agree to denuclearize the Korean Peninsula, North Korea may surreptitiously violate the agreement or renege on its commitments. The United States may contemplate military force to disarm North Korea or to take control of North Korea's nuclear arsenal if the Kim regime collapses or the Korean Peninsula otherwise plunges into chaos. In any of these scenarios, China is likely to play a critical role. As a neighbor of North Korea, China has the most at stake and the greatest capability to intervene. This paper considers what China might do in various scenarios involving conflict, chaos, and nuclear weapons in North Korea and how the United States and China might act to further their shared interests.

North Korea's pursuit of nuclear weapons and delivery systems has been a thorn in the side of U.S -China relations for more than two decades. U.S. policymakers and experts agree-halting North Korea's nuclear and missile program is the top priority for the U.S.-China bilateral relationship. On the other hand, the DPKR sees pursuing its nuclear program is also a matter of priority and there is no amount of pressure that will make it dismantle its nuclear arsenals.

Economic Sanction as a Tool to Frustrate the Reunification Agenda

The current economic sanctions by US on the DPKR have long outlived its relevance because despite the sanctions, the DPKR have continued to relate with other parts of the world and refused to backtrack on its quest for uranium nuclear enrichment. The paper argued that the US must as a matter of urgency rescind from its gimmicks and allow the leaders of both North and South Korea to relate, mix merge to foster integration and the spirit of oneness.

From the realist point of view, the economic sanctions place on North Korea have make the DPKR more stronger and persevering in that they were able to survive the sanctions through discipline and self-reliance. The spirit of discipline and focus as enshrined in the Juche Philosophy ensures that the people must take their destinies into their hands by attaining full pledge political independence, economic sovereignty and military self-reliance.

The US and other allies must learn to respect the sanctity of nations and desist from unnecessary interference in country's domestic affairs. The decision for reunification should be entirely left in the hands of the leaders who must as a matter of commitment, lower their national sovereignty, right and pride in favor of a robust economic, socio-cultural benefit. Both leaders should see the reunification agenda as a brilliant opportunity to deepen trust and interdependency in the peninsula by refusing to yield to US divisionary ploy to make peace difficult in the region.

Conclusion and Recommendations

The division of the Korean Peninsula for the past three and half decades have witness the skeptism, fear, tension and uncertainties in the region. This was fuelled by the western interest particularly the US and its allies. On the other hand, the DPKR have spent huge sum in its nuclear enrichment with less regards to the implication of

housing this WMD within its shores. The budget use for the creation and sustaining these WMD could be rechanneled into other sectors that will have a far-reaching impact on the citizens. The paper is not oblivion of the chaotic nature of the international politics and how the supposedly big nations exact influences on weaker nation, the Korean peninsula needs to catch up with its neighbors like Singapore, China, Malaysia and Taiwan in terms of real development.

The reunification agenda of the Korean Peninsula is apt and timely as there is no any better time than now when the world is faced with various cases of terrorism, climate change and migration. If achieved, the reunification will herald a new down characterized with integration, economic boost and strengthening of the regional security block to guard their countries from both internal and external intruders. It is our hope that the leaders of North and South Korea will make frantic effort towards the reunification agenda to forestall outbreak of crisis with attendant's human catastrophe. The following recommendations are considered germane in a bid to make the reunification an enduring one. 1- Both leaders should see the idea as a noble one by making commitments towards the realization of the agenda through migration, commerce and the elimination of barriers to trade. 2- The United Nations should invoke the necessary penalty/sanction on any nation that refused to respect its chatter. This will further guarantee the peace and non-interference in the domestic affairs of smaller nations by a relatively stronger one. 3- The US should unconditionally remove the long embargo/sanction place on the DPKR. This will further enhance trade and other forms of economic activities between the North and South.

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Economic Determinants Of Tax Compliance AmongAgro-Allied Industries in Katsina State, Nigeria

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Abstract

One of the most effective and efficient means of revenue generation that can be used to achieve growth and development by the Nigerian government is tax. However, this can only be achieved through effective tax compliance by the taxpayers like agro-allied industries. Importantly, the agro-allied industries are one of the emerging sub-sectors that can provide government with more tax revenue, which are dominantly present in some local government areas of Katsina state. Therefore, this study empirically investigates the economic factors that determine tax compliance among agro-allied industries in some selected local government areas of Katsina state. In this direction, primary data was collected from 133 agro-allied industries in six (6) local government areas of Katsina state through the use of structured questionnaire and multinomial logit model was adopted for data estimation. The findings basically show that perception on government spending and level of income have significant effects on tax compliance among agro-allied industries; whereas, tax rate indicates insignificant effects on tax compliance. Flowing from the findings, this study recommends that tax rates should be kept moderately low by the government, so as to fiscally motivate taxpayers to comply positively. Similarly, tax authorities should introduce efficient e-tax management platform, in order to control corruption in tax administration, stimulate voluntary tax compliance and provide convenient tax payment procedures, in order to prevent/reduce tax evasion in the country.

Keywords: Agro-allied industries, Fiscal policy, Logit model, Nigeria, Tax compliance, Economic determinants.

1.0 Introduction

In recent times, Nigerian government decides to diversify her economy in order to reduce over-reliance on oil products (ERGP, 2017). One of the measures taken to achieve this goal is the closure of land borders so as to control the importation of some goods, agricultural output inclusive. The policy aims at boosting the capacity of local farmers and encouraging the scale of agricultural processing industries. This results to establishment of a number of agro-allied industries all over the country; and agro-allied industries are companies, which agriculture serves as the source of

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their raw-materials for the production of finished goods for human and animal consumption. According to Jelilov and Bahago (2017), agro-allied industry is an industry which aims at manufacturing of agricultural inputs and application of modern technology in the production, processing and packaging of farm produce (food and related item). Therefore, it is instructive to state that the role of agriculture in economic development cannot be over-emphasized.

Some of the several economic roles of agriculture include among others: provision of labor to urbanized industries, supply of food and higher income to the teeming population, successful flow of savings for industrial investments, creation of markets for industrial output, means of export earnings and production of primary materials for agro-allied industries (Johnston and Mellor, 1961). According to Anyanwu (1997), agriculture has been the main source of food, local raw materials for industries, gainful employment, and also a reliable source of government revenue, which is generated through personal and corporate income taxes. Therefore, agriculture is one of the major sources of revenue to the government, more specifically the company income tax, which is imposed on corporate bodies like the agro-allied industries. For instance, a study conducted by Harvard Business School in 2014 on the tomato value-chain in Nigeria confirmed that Nigeria is among the 13 largest producers of tomato in the world but unfortunately, is one of the largest importers of tomato paste in the world. The study further pointed out that, in average, Nigeria produces 1.5 million metric tonnesof tomato yearly, in which 50% of the harvest get bad before reaching market as a result of inadequate infrastructures and equipment, and the remaining half is sold at a very cheap price due to the general oversupply in the market and the perishable nature of the product (Harvard Business School, 2014). Nonetheless, Jelilov and Bahago (2017) stated that millions of metric tonnes of agricultural output are produced each year in Nigeria, out of which a reasonable amounts get worse within a very short time after harvest. This results to a shortage in supply of these agricultural products. Therefore, in order to process the agricultural output and maintain the supply all the year round, agro-allied industries were set-up by governments and private organizations in various states, Katsina state inclusive.

Considering the increasing number and nature of agro-allied industries, Nigerian government can surely generate more tax revenue from the sector, in order to promote growth and development. But this could be impossible without effective compliance with the tax laws. Surprisingly, Oyedele (2016) describes tax compliance in Nigeria as bad with 12 percent rate of compliance. Nevertheless, despite the recent progress achieved by the PMB's administration regarding corporate income tax registration, the immediate past Minister of Finance – Mrs. Kemi Adeosun stated that "over 75% of the registered corporate bodies were outside the tax net, out of which 65 percent do not file returns in order not to pay tax at all" (Oyedele, 2016, p. 2) According to HM Treasury, Revenue and Custom (2019), the challenges surrounding tax collection and payment procedures are

characterized by tax evasion, tax avoidance and other forms of tax non-compliance, which can be found across all types of taxpayers and taxes.

In this direction, economic determinants/factors in relation to tax compliance refers to the steps taken to measure the costs and benefits in relation to tax collection (Loo, 2006). According to Alm (1995), taxpayers are logical economic evaders who try to measure the costs and/or benefit of evading tax. This factor is amajor category among the determinants of tax compliance. It includes sub-factors like tax rate, level of income and perception on government spending (Deyganto, 2018). According to Whitte and Woodbury (1985), a higher marginal tax rate may likely result to a rapid increase in tax evasion. Alm (1995) found that tax rate is positively related with tax compliance. But Tanzi (1980) observed that it has negative correlation with tax compliance i.e. the higher the tax rate the lower the compliance, which is consistent with the Laffer curve concept. According to Sparc Report (2014), various tax authorities in Nigeria have been coming-up with various policy measures to encourage positive compliance among taxpayers.

However, addressing the issue of tax compliance requires a clear understanding of factors that are fundamental to the individual taxpayers in making decision of whether to comply positively or negatively with the tax laws. More especially, Kirchler (2007) stated that factors affecting tax compliance differ from society to society and also from individual taxpayer to another taxpayer. Because of this reason, this study chose to analyze the economic determinants, in order to examine their effects on tax compliance, with a particular focus on agro-allied industries in Katsina state. Based on the above stated problem, this study aims to empirically examine the economic determinants of tax compliance among agro-allied industries with evidence from selected local governments in Katsina state, Nigeria. In this regard, the specific objectives to be achieved are: (i) to investigate the effect of perception on government spending on tax compliance among agro-allied industries in Katsina state; (ii) to examine the effect of level of income on tax compliance among agro-allied industries in Katsina state; and (iii) to evaluate the effect of tax rate on tax compliance among agro-allied industries in Katsina state. As a matter of fact, flowing from the objectives of this study the following hypotheses have been formulated for validation:$H_{01:}$ There is no significant effect of perception on government spending on tax compliance among agro-allied industries in Katsina state; H_{02}: Levelofincomehas no significant effect on tax compliance among agro-allied industries in Katsina state; and H_{03}: Tax rate does not significantly affect tax compliance among agro-allied industries in Katsina state.

2.0 LITERATURE REVIEW

2.1 Theoretical Literature

Among the most popular and widely cited theories on taxation in the literature is the ability to pay theory. This theory advocates that taxpayer should pay taxes according to their abilities. It is the most popular theory of taxation based on the principle of equity and justice; and it thus explains its wide acceptability among scholars and

practitioners on taxation (Obara &Nangih, 2017). According to Ojochogwu and Stephen (2012), the government should consider the ability of taxpayers before setting the tax, in order to enhance even distribution of income. In this vein, the theory suggests that when the financial ability of Mr. A is more than that of Mr. B, then the former should pay more tax than the latter. However, some scholars recommend that income is the appropriate measure of ability to pay tax; some of them are of the opinion that expenditure is the best determinant of ability to pay; whereas others are of the view that ownership of properties is the proper factor that determine the ability to pay tax. Ocheni (2015) stated that the theory started in the 16th century, and subsequently extended by the Swiss philosopher-Jean Jacques Rousseau (1712-1778), and the French political economist-Jean Baptiste Say (1767-1832).

Another prominent theory on taxation, especially on tax compliance is economic deterrence theory, which describes taxpayer as a rational being who compares the gain and cost of evading tax; if the benefit (money not paid as tax) exceeds the cost (penalty after tax audit) it will result to a serious tax evasion, reverse is the case. According to this theory, the problem of tax evasion can be curtailed through either persuasive or punitive measures. Punitive measure is based on increase in the rate of penalties and probability of audit, while persuasive measure is achieved through reward and impacting tax knowledge to the taxpayers (Feld & Frey, 2007). Falkinger and Walther (1991) argued that combination of reward and penalty is more effective in dealing with the problem of tax evasion than punishment only. Devos (2014) posits that deterrent effect may not necessarily be achieved through increase in penalties when a taxpayer is sure that a probability of being caught is low. According to Franzoni (1999), a proper application of economic deterrence theory is the most efficient way of resolving the challenges surrounding tax collection.

2.2 Empirical Literature

Some of the study studies on determinants of tax compliance include that by Assfawa and Sebhat (2019), which investigates the relationship between tax compliance and its determinants in Kaffa, Bench Maji and Sheka zones category B taxpayers, SNNPR, Ethiopia. Ordered logit model was adopted for data analysis. The findings show that tax compliance was positively affected by taxpayers' level of education, taxpayers' awareness and their level of tax knowledge, simplicity of the tax system, taxpayers' attitude towards tax, perception of taxpayers on government expenditure, and rewarding scheme for loyalty among taxpayers. These findings are consistent with the findings of Riahi-Belkaoui (2004) and Richardson (2008). Another study by Tilahun (2018) examines the economic and social factors of voluntary tax compliance in Bahir dar city. The study employed ordered logit model for data analysis. As such, the evidence revealed that factors such as tax rate, taxpayers' perceptions on government expenditure, efficiency of the tax system, penalty after tax audit and cost of compliance were found to be the factors determining taxpayers' voluntary compliance.

Also, a study by Manaye (2018) examines the determinants of tax compliance in Wolaita Sodo and Tercha Town, Ethiopia. The study adopted multiple linear regression model for estimation. The findings show that tax compliance behavior was influenced by tax audit, personal financial constraints, and changes in government policy. A similar study was conducted by Deyganto (2018) on the factors influencing taxpayers' voluntary compliance attitude with tax system in Southern Ethiopia and the study adopted binary logistic regression model. The findings indicate that the major factors affecting taxpayers' voluntary compliance behavior in the study area are age, probability of being audited, gender, lack of tax knowledge, perception on tax rate, awareness on penalty and simplicity of tax system. Other variables such as tax authority efficiency, perception on fairness and equity, education level, peer influence, occupation, perception on government speeding and income level of taxpayers, are not significant in determining tax voluntary compliance attitude.

Similarly, Puri, Bambang and Lukytawati (2018) interrogated determinants of tax compliance in tax amnesty programmes with the use of experimental approach and variance analysis. Their findings indicate that taxpayers with lower income are more compliant than taxpayers from higher income level. Furthermore, the taxpayers prefer to declare their income at lower tax rates. Similarly, the enforcement tools adopted by the government like tax penalties and tax audit shows significant effect on tax compliance. Furthermore, a study was conducted by Adimassu and Jerene (2016) to examine the factors that influence taxpayer's voluntary compliance behavior in Self-Assessment System in Southern Nation Nationalities and Peoples` Regional State (SNNPRS), Ethiopia. This study employs Pearson correlation matrix and logistic regression model for data analyze. The results of this study revealed that perception on government spending, tax knowledge, probability of auditing, simplicity of tax returns and administration, perception on fairness and equity and the influence of referral group were factors determining the voluntary compliance attitude in Self-Assessment System (SAS).

Also, Ojochogwu and Stephen (2012) investigated the factors that affect tax compliance among Small and Medium Enterprises (SMEs) in north Central Nigeria utilizing logit model to analyze the response variable. Some of the findings emanating from the study suggest that factors such as difficulties in filing procedure and high tax rates are the most significant determinants the lead to tax non-compliance among SMEs. In the same vein, other factors that have lesser effects include lack of tax knowledge and multiple taxation affect tax compliance among the SMEs. The results support previous findings in the works of Park and Hyun (2003) and Tanzi (1980). Anyaduba, Eragbhe and Kennedy (2012) used ordinary least square (OLS) regression technique to examine the effects of deterrent tax measures on tax compliance in Nigeria. It was found that the existing deterrent tax measures in Nigeria are inadequate and have not helped to promote tax compliance in the country. It was also discovered that fostering voluntary

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compliance and enhancing taxpayer's morale will enhance tax compliance.

3.0 DATA AND METHODOLOGY

3.1 Data

This study investigates the economic determinants of tax compliance among agro-allied industries with particular emphasis on six (6) local government areas in Katsina state, which include: Funtua, Dandume, Faskari, Bakori, Malumfashi and Kankara. All these local governments belong to the same senatorial zone (Katsina South/ Funtua senatorial zone); and the main occupation of the people residing in these areasis agriculture. The crops grown include: Maize, Guinea corn, Cotton, Groundnut, Rice, Yam, Sugar cane and Soya beans, among others. Animal husbandry, fishery, poultry farming, agro-forestry and garden, are other forms of economic activities (Sesp, 2010).That is why most of the agro-allied industries in the state are located around this area. Some of the industries are owned by government while some by private individuals. They include industries such as: Fertilizer Processing Plants, Cotton Ginneries, Oil and Flour Mills, and Rice Mills, among others. Some industries are large scale while others are micro, small and medium.

Due to the nature of this study, primary source of data was utilized through the use of self-administered questionnaire. The population of the study constitutes all the agro-allied industries located in the six (6) selected local governments of Katsina state. Those local governments are chosen due to the fact that most of the agro-allied industries in the state are located there. Thus, the study adopted purposive sampling technique to choose the members of the population to be considered in the study base on judgment of the area of study. Furthermore, the total population sampling method was adopted as a result of the fact that the population size is small. According to Kothari (2004), total population sampling is a type of purposive sampling technique where a researcher decides to analyze the entire members of the population in which the population size is relatively small and the elements share a common set of characteristics. In this connection, all the 133 agro-allied industries located in the six (6) selected local government areas were purposively selected. Moreover, the questionnaire was designed with some modifications from previous similar related works by Magiya (2016) and Musau (2015). Moreover, the Cronbach Alpha test was utilized to test the reliability of the questionnaire instrument. Table 2 provides more information regarding the reliability test.

3.2 Theoretical Framework

Economic determinants of tax compliance are tax rate, level of income and perception on government spending (Deyganto, 2018). Therefore, the three variables listed on the right hand side of figure 1, which include perception on government spending, level of income and tax rate (economic factors) are the independent variables, while the variable at the left hand side (tax compliance) is the dependent variable.

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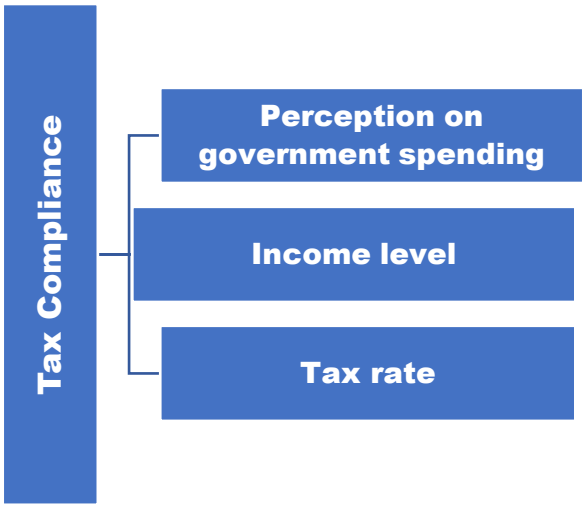

Figure 1. Model of Economic Determinant of Tax Compliance

Source: Constructed by the Authors (2020).

Furthermore, the variables which were used to achieve the objectives of this study are as follows: Tax compliance (TC) as dependent variable, while tax rate (TR), level of income (LI), and perception on government spending (PGS) are the independent variables as presented in table 1.

Table 1: Components of the Dependent and Independent Variables

Dependent Variable: Tax Compliance (multiple response variable)	• Tax compliance • Tax evasion • Tax avoidance • Other forms of tax non-compliance
Independent Variables: (Economic Determinants of Tax Compliance)	• Tax rate • Level of income • Perception on government spending

Source: Compiled by the Authors (2020).

A related study by Deyganto (2008) and Ojochogwu and Stephen (2012) adopted qualitative research technique to analyze the tax compliance determinants by allowing the response variable (dependent variable) to take two (2) values only, which are tax compliance and tax non-compliance (positive and negative compliance).

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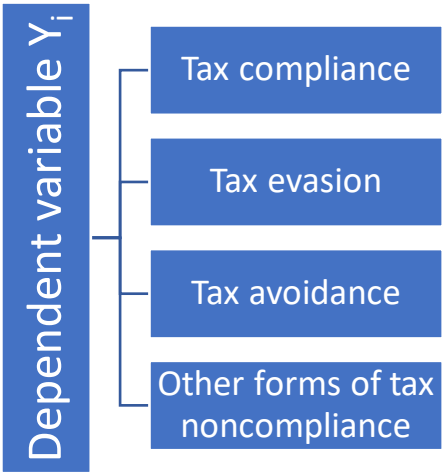

Figure 2: Multiple Response Variables

Source: Constructed by the Authors (2020).

However, this research is design in such a way that the dependent variable takes four (4) responses as shown in figure 2 i.e. tax compliance, tax evasion, tax avoidance and other forms of tax noncompliance, in order to achieve robust responses for better results and findings.

3.3 Model Specification

Accordingly, the study considered tax compliance (TC) as dependent variable, while perception on government spending (PGS), level of income (LI) and tax rate (TR) are the explanatory variables as provided in table 1 and figure 1. Based on the stated variables, the following functional model was developed:

TC = f (PGS, LI, TR)……
……....1

Where TC is the tax compliance, PGS is the perception on government spending, LI is the level of income and TR is the tax rate. Based on the above equation, the following econometric model was formulated:

$Y_i = \beta_0 + \beta_1 PGS_i + \beta_2 LI_i + \beta_3 TR_i + e_i$……
…… 2

Where:

PGS_i,LI_i, and $TR_i$are the explanatory variables, β_0 is the intercept, β's are the parameters (coefficients) to be estimated, and e_i is the stochastic error term representing all the unobservable determinants of tax compliance. As presented in figure 2, the dependent variable Y_i has the probability of more responses which cannot be ranked or ordered in any natural way, they are essentially nominal in character. As such, multinomial logit model was adopted for data analysis. Thus, the choice pattern of multinomial logit model can take the following forms:

$$Y_i = X_{TC}\,\beta_{TC} + e_{TC}$$

$$Y_i = X_{TE}\,\beta_{TE} + e_{TE}$$

$$Y_i = X_{TA}\,\beta_{TA} + e_{TA}$$

$$Y_i = X_{TN}\,\beta_{TN} + e_{TN}$$

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Where:

TC = Tax Compliance

TE = Tax Evasion

TA = Tax Avoidance

TN = other forms of Tax Non-compliance

e_{TC}, e_{TE}, e_{TA} and e_{TN} are error terms.

However, if

$$X_{TC}\,\beta_{TC} + e_{TC} > \max(X_{TE}\beta_{TE} + e_{TE}, X_{TA}\beta_{TA} + e_{TA}, X_{TN}\beta_{TN} + e_{TN}) \text{ then } Y_i = 1 \ldots\ldots\ldots\ldots 3$$

$$X_{TE}\,\beta_{TE} + e_{TE} > \max(X_{TC}\beta_{TC} + e_{TC}, X_{TA}\beta_{TA} + e_{TA}, X_{TN}\beta_{TN} + e_{TN}) \text{ then } Y_i = 2\ldots\ldots\ldots\ldots 4$$

$$X_{TA}\,\beta_{TA} + e_{TA} > \max(X_{TC}\beta_{TC} + e_{TC}, X_{TE}\beta_{TE} + e_{TE}, X_{TN}\beta_{TN} + e_{TN}) \text{ then } Y_i = 3 \ldots\ldots\ldots\ldots 5$$

$$X_{TN}\,\beta_{TN} + e_{TN} > \max(X_{TC}\beta_{TC} + e_{TC}, X_{TE}\beta_{TE} + e_{TE}, X_{TA}\beta_{TA} + e_{TA}) \text{ then } Y_i = 4 \ldots\ldots\ldots\ldots 6$$

The above equations show that when Y_i = 1the taxpayer complies positively with the tax laws, but when Y_i = 2 the taxpayer evades the tax, for Y_i = 3 he avoids tax and lastly when Y_i = 4 the taxpayer has other forms of non-compliance.

4.0 RESULTS AND DISCUSSIONS

4.1 Summary of Descriptive Statistics

The study distributed 133 copies of questionnaires to the agro-allied industries located inthe six (6) selected local government areas of Katsina state in which 108 copies were correctly filled and returned back. As such, 81.2% rate of return was achieved. In this connection, table 2 presents the summary of descriptive statistics. As shown in the table, 108 is the total number of observations where the mean value of the variables ranges between 2.03 - 0.63. Furthermore, PGS has the highest mean score (2.03) and standard deviation (0.926) with 1 as minimum and 3 as maximum. This implies that on average the respondents are on the opinion that the government spending is moderate, and that the variability between the mean and the individual responses is low. Accordingly, the variable TR recorded the least mean value of 0.63 and standard deviation of 0.540 with minimum of 1 and maximum of 3, it also, has the lowest. This informal evidence depicts that the respondents have perception that the tax rate is high with least variability from the mean score.

Moreover, the table shows that all the series of the variables are positively skewed to the right. The Kurtosis statistics indicates that all the series were approximately equal to three (3). Hence, the data series used for analysis in this study is symmetric and normally distributed.

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Table 2: Descriptive Statistics

Statistics Criteria	**TR**	**LI**	**PGS**	**TC**
Observations	108	108	108	108
Mean	.63	1.66	2.03	1.76
Variance	.291	.676	1.224	.857
Standard Deviation	.540	.822	.926	.920
Skewness	1.608	.914	1.126	1.501
Kurtosis	2.933	2.845	2.710	3.015
Minimum	1.000	1.000	1.000	.000
Maximum	3	3	3	3

Source: Authors' Computation (2020).

Table 3 shows the result of reliability test using Cronbach's Alpha where it is revealed that, the scores of the entire reliability test has Cronbach's Alpha score of 0.80 which is greater than 0.60 benchmark adopted for the study (Sekaran, 2003). Hence, this high rate of reliability score indicates the presence of internal consistence among the four dimensional constructs used in this study. More so, the table revealed the result of independent score of each of the dimensions in the study, in which the level of income being the dimension with high Cronbach's Alpha score of 0.78, followed by tax rate and perception on government spending with 0.70 each and lastly in this regard is the tax compliance with the least of Cronbach's Alphas score of 0.61.

Table 3 Result of Reliability Test

Variables	Cronbach's Alpha Scores	No. of items
Tax rate	0.70	5
Level of income	0.78	5
Perception on government spending	0.70	5
Tax compliance	0.61	10
Overall test scale	0.80	

Source: Author's Computation Using SPSS 20.0 (2020).

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Also, table 4 indicates that one hundred and eight (108) is the total number of questionnaires correctly filled and returned back, out of which 43 copies are in favor of tax compliance capturing 39.8 percent. Furthermore, 62 copies are in favor of tax evasion covering 57.4 percent; while, only 3 responses are related to tax avoidance taking 2.8 percent; and other forms of noncompliance has zero outcome. Therefore, the total number of the valid cases as presented in the table is 108. This implies that out of the total number of 108, 43 taxpayers do comply with the tax laws; 62 of them do evade the tax and only three (3) do avoid it.

Table 4: Case Processing Summary

Variable	Options	Number	Marginal Percentage
TC	COMPLIANCE	43	39.8%
	EVASION	62	57.4%
	AVOIDANCE	3	2.8%
Valid Cases		108	
Missing		0	
Total		108	
Subpopulation		25	

Source: Authors' Computation (2020).

Table 5 presents model fitting information, in this regard a null hypothesis that the explanatory variables did not fit the model is tested against alternative hypothesis. The value of chi-square tabulated at 5 percent significance level is 15.507 which is less than the calculated value of 19.8 as shown in table 5. As such, the evidence is consistent with alternative hypothesis that the explanatory variables fit the model. In this connection, the explanatory variables incorporated in the model are among the best set of economic variables explaining the tax compliance behavior among agro-allied industries in the study area.

Table 5: Result of Chi-Square Test

Model	Model Fitting Criteria		Likelihood Ratio Tests	
	-2 Log Likelihood	Chi-Square	Df	P-value
Intercept Only	69.079			
Final	49.157	19.812	8	.002

Source: Authors' Computation (2020).

Also, table 6 contains the results of Pseudo R-square and the study considers Nagelkerke, which is 0.412. This implies that 41.20% variation in tax compliance is

explained by the predictor variables (perception on government spending,level of incomeandtax rate). The implication of this evidence is that, there are many factors determining tax compliance behavior such as those under social, institutional, individual, demographic and economic factors (Palil, 2010; Kirchler, 2007; Loo, 2006) but this study considers only economic factors.

Table 6: Pseudo R-Square Measures

Cox and Snell	.362
Nagelkerke	.412
McFadden	.306

Source: Authors' Computation (2020).

Table 7 presents the results of likelihood ratio tests, here, the null hypothesis for all the explanatory variable is tested against alternative using chi-square test. As presented in the table, the value of chi-square calculated for variable PGS is 7.241 which is greater than tabulated value at 5% level of significance (5.991). Therefore, the study is in favor of alternative hypothesis and concludes that the variable quite fit the model. Accordingly, the value of chi-square calculated for variable LI (15.321) is greater than the tabulated value at 5% level of significance (5.991). Hence, the study rejects the null hypothesis and concludes that LI fits the model. Lastly, in this regard, is the value of chi-square calculated of variable (TR), which is 4.664. This is less than the tabulated value at 5% significance level (5.991). Therefore, the null hypothesis is accepted that (TR) does not individually fit the model.

Table 7: Likelihood Ratio Tests

Effect	Model Fitting Criteria		Likelihood Ratio Test	
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	59.3577[a]	9.411	2	.002
PGS	58.237	7.241	2	.037
LI	63.398	15.321	2	.000
TR	54.961[a]	4.664	2	.101

Source: Authors' Computation (2020).

4.2 Presentation of Multinomial Regression Estimates

Essentially, table 8 presents the result of multinomial logit regression model in which the value of coefficient regarding PGS is 12.074 signifying positive relationship between perception on government spending and tax compliance. Furthermore, the coefficient of LI is -26.130, this shows negative relationship between tax compliance and level of

income; the higher the level of income the lower the tax compliance. Taking a look at TR which has -0.785 as coefficient, this indicates that the tax rate is inversely related with tax compliance.

Table 8: Result of Multinomial Logit Regression

TC		Coef. (β)	Std. Error	t-cal	Df	P-value
Compliance	Intercept	53.430	2.422	486.841	1	.000
	PGS	12.074	.223	2927.761	1	.000
	LI	-26.130	.445	3442.975	1	.000
	TR	-.785	.805	.952	1	.329

Source: Authors' Computation (2020).

4.3 Discussion of Findings

From table 8, the value of the parameter pertaining PGS is 12.074, implying that a 1% increase in perception on government spending leads to 12.074 increase in tax compliance. The value of t-calculated (2927.8) is greater than the value of t-tabulated at 5% significance level (1.980); and the probability value is 0.000. Hence, hypothesis H_{01} is rejected. Therefore, the study established that PGS is a significant determinant of tax compliance among agro-allied industries in the six (6) selected local governments in Katsina state. The implication is that increase in the provision of infrastructures would make taxpayers to be satisfied with the way government spends the public funds and that tends to increase the level of compliance behavior. Therefore, the taxpayers consider capital project as an encouraging factor for complying with the tax laws. This evidence is consistent with the findings of Assfawa and Sebhat (2019).

Also, the coefficient of LI (-26.130), signifies that a 1% increase in the level of income leads to 26.130 decrease in tax compliance. From the table, 3442.98 is the value of t-calculated, which is greater than the value of t-tabulated at 5% significance level (1.980). Similarly, the p-value (0.000) is less than 1% significance level. Therefore, hypothesis H_{02} is rejected. As such, the study concludes that level of income is significant in explaining tax compliance in the study area. This suggests that when a taxpayer realizes that he shall pay a high amount of tax to the government due to his high level of income, it may discourage him to comply by following several steps to reduce tax liability, in order to pay lesser tax. This evidence is consistent with that of Mohani (2001). Furthermore, the magnitude of the parameter regarding variable TR is -0.785, which signifies that a 1% increase in tax rate leads to 0.785 decrease in tax compliance. The result shows that TR is insignificant in explaining tax compliance, because the value of t-calculated is 0.952, which is less than the t-tabulated at 5% level of significance (1.980).

As such, hypothesis H_{03} is accepted. Hence, the result proves that TR i.e. tax rate is insignificant in explaining the behavior of tax compliance among agro-allied

industries in Katsina state. This evidence is consistent with findings of Tanzi (1980) and it is also consistent with the position of Laffer curve concept, which established inverse relationship between tax rate and tax compliance. Therefore, this finding implies that when taxpayers perceive the favorability of tax rate (i.e. low tax rate), it used to motivate their attitudes towards tax compliance by increasing the level of compliance; and when it is unfavorable (high), they tend to behave negatively towards tax laws by reducing the level of compliance. As such, a rise in tax rate encourages the taxpayers to declare less income, in order to compensate reduction in real income.

5.0 Conclusion and Recommendations

The main aim of this study is to analyze the economic determinants of tax compliance among agro-allied industries in Katsina state, Nigeria. Hence, the study obtained relevant information/data from the field through the use of self-administered questionnaires. As such, multinomial logit model was adopted for data analysis. Essentially, the finding of the study shows that perception on government spending positively and significantly affects tax compliance, while the level of income is a negative and significant determinant of tax compliance. Accordingly, the evidence proves that tax rate is a negative and insignificant determinant of tax compliance among agro- allied industries in the study area.

Based on the foregoing discussions the study recommends: (i.) tax rates should be kept moderately low by the government in order to motivate the taxpayers to comply positively. (ii.) the government should formulate efficient policy measures with the aim of boosting the capacity of micro, small and medium scale enterprises in terms of financial capital and technical expertise. (iii.) regular awareness and publicity should be organized by the tax authorities so as to sensitize taxpayers, especially corporate organizations like agro-allied industries which may result to increase in the level of compliance among the taxpayers; and (iv.) e-tax management platform should be introduced by tax authorities like the Katsina State Board of Internal Revenue. This may assist in controlling corruption among tax officials, motivate voluntary tax compliance and provide convenient tax payment procedures, in order to prevent/reduce the rate of tax evasion in the country, which shall enhance tax revenue for development.

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Panel Quantile Analysis on the Economic Growth-Foreign Direct Investment Nexus: Evidence from West Africa.

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Abstract

This study examines the relationship between Foreign direct investment (FDI) and economic growth in the selected West African countriesbetween 1998 to 2018. UsingPanel Quantile Regression techniques. The findings discloses that FDI enhances growth both at lower and higher quantile in the West African region. The study recommended that policymakers should make striking efforts to attract additional inflow of foreign capital in the region

KEYWORDS*:* Panel quantile, Economic Growth, Forign Direct Investment

1. Introduction

The pursuit of economic growth is a macroeconomic goal that most countries strive for. Throughout the years, Different countries have implemented several ways through which this goal will be fulfilled. Investment, as a critical component of total expenditure in every economy, is critical to growth through higher productivity. Employment and productivity levelsOkwu et al. (2020). Most developing countries rely on it. Foreign Direct Investment (FDI) is attracting attention to boost economic growth. Several substantial reforms have been implemented. To improve legal, governance, political, and regulatory frameworks, work has been done. Give investors with an enabling investment(Bisson, 2011) .

Foreign Direct Investment (FDI) was not regarded as positive factor earlier in Africa and other developing countries, rather considered and suspected of negating national sovereignty, social welfare and domestic economy. Market globalization, changes in the global production system and

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international monetary policies, led to the changes in the perception of these economies toward foreign direct investment. And thus, radically change the attitude of African continent and specifically west African region that is blessed with abundant unemployed mineral resources, on foreign direct investment.FDI is now increasingly needed by developed and developing countries, considering it as a dominant factor. It is now of considered as a means of communicating development, transfer of wealth and technology and thus, an approach to finance economic growth and development. Thus, the global economy has been completely transformed in recent years

Despite the importance of FDI on employing abundant natural resources in West Africa a panel studies that examines the connection arescant. Most of the studies are either on individual countries or a panel study that produces a mean result without consideration to the different quantile heterogeneity. Today these countries have considered FDI as positive factor of achieving economic growth and possibly development. Foreign direct investment (FDI) flows increase drastically and substantially over the last twenty years. FDI is now important means of sourcing private external finance for developing economies.It is against this backdrop that this study aimed at examining the effect of FDI on economic growth of the West African countries both at lower and upper quantile.The outcome will help in filling the existing lacuna in the literature and also served as a reference point for the policymakers in the African sub-region.

2. Literature Review

There are several theoretical and empirical viewson the nexus between economic growth and foreign direct investment (FDI). Theoretically, FDI is expected to enhance growth by transferring technology, improving balance of payment as well as employment of material and human resources. Empirically,Okwu et al. (2020);Melnyk et al. (2014) studies investigated how FDI flows influence economic growth. The outcomesreveal significant positive impact of FDI on economic growth during the study period. Fernando & Celso (2016) also examines the long-term relationships between FDI and economic growth of SSA countries using recently developed econometric techniques that control for sample heterogeneity and capture long term relations. The study confirms that FDI affects growth positively in the long run. This is in line with the view that FDI inflows can stimulate growth for the host countries by increasing the capital stock, creating new job opportunities, and easing the transfer of technology (Borensztein et al., 1998; De Gregorio, 2003; De Mello, 1997). Also,Mah (2010)opined that FDI inflows create new investment and thus enhances growth economic growth of the host community

Although the existing studies generally suggest a positive impact of FDI on economic growth, it is also possible that FDI has negative effects on economic growth by crowding out domestic investment,

increasing external vulnerability, and causing dependence(Aitken & Harrison, 1999; Lipsey, 2002).Also,Carkovic&& Levine (2002) have found that FDI does not exert a significant, positive impact on economic growth in developing countries. Azman-Saini et al. (2010) examine the systemic link between economic freedom, foreign direct investment (FDI) and economic growth in a panel of 85 countries. The empirical results show that FDI by itself has no direct effect (positive) impact on output growth.

There is no consistency in the literature on the connection between FDI and growth. Moreover, the methodology adopted provides mean results without regards to different quantiles in the observations. This study, therefore, intend to fill in this lacuna.

Data and Methodology

Data

The data is a panel data set of 9 selected West African countries over a period of 1998–2018. Data on FDI Foreign direct investment, net inflows % of GDP, the GDP-growth rate, and mineral rent % GDP are sourced from World development

indicators. The countries are selected based on the availability of data

Methodology

To examine thisrelationship at different quantile, the choice of the appropriate technique is an important theoretical and empirical question. Panel Quantile Regression (PQR) analysis is best to examine the relationship between our FDI and GDP variables. Therefore, this paper empirically strategized into 2 main stages. First, unit root tests analysis is undertaken in panel series. Second, the PQR technique is employed to examine the relationship at lower and upper quantile.

Model

The general specification of the model which the study estimated can be written as

follows as in the study of (Abbes et al., 2015).

$$GDPG_{it} = \alpha_{0i} + FDI_{it} + MRT_{it} + e_{it}$$

where GDPG is the gross domestic product of country i, for the period t, FDI is the Foreign direct investment of country i, given at the period *t*, *e* is an error term.

4. Results

Table1 present a result of the unit root tests onIm et al. (2003); Levin et al. (2002) performed for the study. Majority of the statistics are not significant at the 5% level for both variables (GDP and FDI). After differentiation into first degree data, we notice a significant way that all data are stationary for both variables. These results led us to a logical way to test for the presence or absence of a long-term relationship between GDP and FDI by applying Co-integration test

Table 1 Unit root test result

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Variables	Statistics	Level I(O)		First difference I(1)	
		Constant	Constant & Trend	Constant	Constant & Trend
FDI	LLC	-3.3645	-3.7582	-8.3045	-7.5827
		(0.0090)***	(0.0029)***	(0.0000)***	(0.0000)***
	IPS	-1.3850	-1.5756	-7.7829	-5.7867
		(0.0085)***	(0.0576)*	(0.0000)***	(0.0000)***
	FDF	-2.8351	-1.9923	-12.1952	-8.8729
		(0.0033)***	(0.0260)**	(0.0000)***	(0.0000)***
	FPP	-7.4960	-6.6297	-6.1055	-7.3643
		(0.0000)***	(0.0080)***	(0.0000)	(0.0000)***
GDPG	LLC	-4.4475	-7.0210	-16.2101	-14.4443
			(0.0000)***	(0.0000)***	(0.0000)**
		(0.0000)***			
	IPS	-2.9570	-3.8612	-10.5418	-8.6069
		(0.0016)***	(0.0001)***	(0.0000)***	(0.0000)***
	FDF	4.7295	-7.0820	-15.7591	-13.1527
		(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***
	FPP	-7.7181	-3.8684	-14.5493	-11.5465
		(0.0000)***	(0.0002)***	(0.0000)***	(0.0000)***
MRT	LLC	-08765	-2.8120-	-4.6472	-3.2529
		(0.2226)	(0.0021)***	(0.0000)***	(0.0008)***
	IPS	1.9590	-0.9365	-3.2701	-2.3868
		(0.9749)	(0.1745)	(0.0011)***	(0.0828)*
	FDF	2.2426	-2.2010	-3.6293	-1.6854)
		(0.9853)	(0.1178)	(0.0003)***	(0.0491)**
	FPP	3.4104	2.5178	-6.9445	-5.0861
		(0.9991)	(0.9323)	(0.0000)***	(0.0000)***

Note: The figures outside parenthesis are the t-statics values while those in the parenthesis are p-values.

*** and ** represents 1% and 5% significant levels respectively.

Table 2 shows the panel quantile estimation result for the panel of countries. As earlier expected, GDPG portrays a positive impact on FDI inflow in these panels of countries. The coefficient values of GDPG are positive at both quantiles. However, the impact is significant at 1% level at higher quantile (Q75) compared to 5% of Q50 and the 10% level of significance at lowest quantile 25. This means that FDIenhances growth at both quantiles but at different significant levels. the inflow of the FDI in the region. This may well be attributed to the growth of market size associated with high level of employment by multinational corporations (Boateng, Hua, Nisar, and Wu, 2015; Mah, 2010 and Suleiman; Kaliappan, and Ismail, 2015).The factor variable representing raw-materials in

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the model is the mineral rent (MRT), its coefficient is positive and significant at different levelonly at Q50 and Q75. Meaning that at quantile 50, the positive impact of FDI is significant at 5% level and 1% at quantile 75. This is in line with the finding of (Bokpin, Mensah, and Asamoah, 2015). Suleiman et al. (2015) also reported a significant positive effect of natural resources on FDI. In Sub-Saharan Africa, mineral resources are the main factor attracting FDI inflow in the region (Bokpin et al., 2015).

Table 2 Panel Quantile Regression (PQR) Results. Dependent variable GDPG

Independent Variable	PQR Q-25	PQR (Q-50)	PQR Q-75
FDI	0.173	0.137	0.236
	(1.98) *	(2.51) **	(7.65) ***
MRT	0.245	0.090	0.302
	(1.02)	(2.01) *	(2.55) **

For the robustness check, the studyemploys the services of Pooled Mean Group (PMG) model. Table 3 shows the result of the PQRmodel and PMG estimation and, the outcome shows that the variables are exactly signs with the PMG estimations at a different quantile. This is in line with our assumption; therefore, we could settle that our result from PMG(TER) is valid and reliable

Table 3 PMG and Panel Quantile Regression (PQR) Results. Dependent variable GDPG

Independent Variable	Model 1 PMG	PQR Q-25	PQR (Q-50)	PQR Q-75
Long-run coefficients				
FDI	0.331	0.173	0.137	0.236
	(3.80) ***	(1.98) *	(2.51) **	(7.65) ***
MRT	0.309	0.245	0.090	0.302
	(2.58) **	(1.02)	(2.01) *	(2.55) **
Speed of adjustment (ECT)	-0.691 (-4.40) ***			
Short-run coefficients				
Δ FDI	0.022 (1.97) *			
Δ MRT	0.406 (1.53)			
CONSTANT	0.176 (3.71) ***			
No. of countries	9	9	9	9

Notes: The figures in parenthesis are the z-values except those for Hausman Test which are p-values. ***, ** and * represent 1%, 5% and 10% levels respectively.

5. Conclusion and Policy Recommendations

This paper examines the relationship between FDI and Economic Growth (GDP) for 9 selected countries of west Africa by using panel quantile regression (PQR). The PQR estimations reveals that FDI enhances economic growth of the selected countries significantly at the different levels, with the maximum significant at the highest quantile Finally, the results are of great importance for policy makers and academics. These results may help policymakers to establish priorities regarding the assignment of the resources to facilitate inflow of the Foreign direct investment for the sustainable growth and development. Future research should focus upon the modelling of the relationship between various characteristics of a country that influence FDI and finding the causal relationship between FDI to Economic Growth.

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Effect of Monetary Policy on Trade Openness in Nigeria

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Abstract

This study investigated the effect of monetary policy on trade openness in Nigeria. Annual time series data were used between 1987 and 2020. Haven used broad money growth, lending rate, and exchange rates to proxy monetary policy in Nigeria, VAR/ECMl, and Granger Causality techniques were employed for the analysis.The study found that monetary policy hasa significant effect on trade openness in both the short-run and long-run periods. Specifically, broad money growth has a significant direct/ positive effect on trade openness while lending rate has a significant inverse influence on trade openness. However, the exchange rate does not have any significant swayon trade openness in Nigeria. The study, as such, suggests that monetary policy be used to boost the economy's trade openness by increasing the broad money growth and reducing the lending rate which could improve quality investments for export.

JEL CLASSIFICATION CODE: C33, C52, F41

KEYWORDS: Money supply growth, Monetary Policy, Lending rate, Trade openness.

1. Introduction

International trade has been noted to be a predominant driver of global development in the past four decades (IMF, 2001). Meanwhile, for international trade to exist, there must be economic openness on the part of the participating nations Zahonogo (2017). Through Trade openness (TOPS), output and competitiveness are enhanced via the influence of trade, which also helps in improving the standards of living and sustaining economic development (Gbosi, 1995).

Hence, in pursuit of sustainable productivity, the government of a country always face the dilemma of choosing the measures to employ in its operations, it either chooses protectionist measure or liberalizing measure. There is also debate on which of the measures enhance rapid economic development, and this question is what the policy debate attempts to resolve. The liberationist or openness causes economic integration and development due to the country's opening of its borders to trade with other countries while protectionist policy stands against international trade by closing

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its borders (Adenikinju & Chete, 2002). This was implemented in Nigeria in recent times.

Research have revealed that, over the years, owing to the benefits of liberationist policy, many nations have employed liberationist economic policy over protectionist economic policy. Two factors: globalization and liberationism are seen as major catalysts for the realization of economic growth and wealth of many countries at various stages (IMF;2005). Ude and Agodi (2015) revealed that Liberationist policy is a type of economic policy that accounts for free flow of exchange of goods and services without hindrance from restrictions imposed by the government in terms of regulatory legislation, quotas, high taxes, and tariffs. Openness is quite a good measure of international competition among nations in the world.

The purpose of economic partnership has a primary goal which is to create free trading regions through the removal of trade barriers, reduction of tariffs and commence external-centred trade strategies (Nduka 2013). Adenikinju and Chete (2002) are of the perspective that an economy's openness to trade renders a huge prospect of overcoming challenges caused by trivial local markets (especially in developing countries). This will thereby foster the influx of foreign exchange needed to fund the importation of important products. A liberationist economy encourages the circulation of elements of production such as capital (tangible and human resources), finance and technology, across the nation's borders and thereby promotes the structure of the economic process in the importing nation. Trade openness according to economic theory states that it enhances competition, encourage global specialization and trade fosters effective market, and boost economic development and growth processes (Fratzscher & Bussiere, 2004).

Employing the concept of comparative cost advantage, trade openness gives room for a country to appropriate its resources the importation of products and services at a reduced cost compared to if it were manufactured domestically. The more a country opens itself to trade internationally, the more the integration into the global markets. Trade openness affords evolving economies to import capital equipment and intermediate inputs which may be costly or infeasible to be manufactured locally but are necessary for perpetual development. Some projected advantages of trade openness comprise, intensive competition. The intensive competition allows home-based companies to increase in proficiency compared to if they were under the protectionist policy, though this may be utilized up till when productive capacity is above average. This also affords them better knowledge of novel technologies and foreign ideas (also known as knowledge spillover) (Ude&Agodi, 2015).

Study by Hussaini and Kabuga (2016), identified that t the opening of international markets and boundaries ensures effective resource distribution amongst competing economic units towards trade especially non-oil export sectors.Even with these advantages embedded in trade openness, many researchers, including (Singh, 1994;

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Christopher &Damilola, 2014) have probed the existence and entirety of liberationist policy with the view that it reduces domestic income through taxes and tariffs reduction while some claim that it fosters reduction in the competition of home-based production through depletion in innovation and creativity. Some postulates that the economy will be incapacitated to create jobs thereby leading to unemployment.

Though the economy has strived to propel growth via trade openness, the economic situation only continue to be worseoff. As the country demonstrates more effort towards enhancing her economic growth through trade openness to the international economy, she turns out to be worse, compare to her trading partners, which is determined through growth in the country's productivity. As a result, reviewing Nigeria's liberalization trade policies is cogent and examining the use of monetary policies to realize its macroeconomic aims, is germane.

Thus, an economy's openness can enhance technology procurement. Also, liberationist trade stimulates invention through an exchange of knowledge, technology and investment in development and research via international direct investment.

The Nigerian government implements three kinds of general policies to undertake its aim of resource allocation and revenue distribution (Olaniyi, 1999). The policies are monetary policy, fiscal policy and income policy. To achieve specific economic goals such as macroeconomic goals which include; balance of payment equilibrium, economic growth and development, employment and moderately stable general price level, the Nigerian government has continually depended on monetary policy. This is so because monetary policy has severe effects on income and fiscal policy methods.

The broad objective of this study is to examine the impact of monetary policy on Nigeria Trade openness. Specifically, the paper examines the effect of broad money on trade openness; it examines the influence of lending rate on trade openness, and it determines the effect of exchange rate on trade openness in Nigeria. To existing literature, this study will contribute its significance and also input its fresh findings and discoveries. This study will be of relevance and advantage to scholars, researchers, international trade policy formulators to mention but a few.

Theremaining part of the paper is structured as:Sectiontwo comprises a review of relevant literature; Section three showcases the methodology of the study; Section four presents the findings from the analysis; Section five discusses the findings, and Section six concludes and proffers recommendations.

2.0 Literature Review

2.1 Conceptual Review

2.1.1 Monetary Policy

Though economists have not reached unanimity on how monetary policy react and the extent of its influence on economies, it is generally and strongly agreed that it possessesa substantial effect on an economy

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(Nkoro, 2005). Through the effect of monetary policy on economic factors, it remains an important catalyst of economic growth. Anowor and Okorie (2016) are of the thought that monetary policy has been in existence since the period of Adam Smith and that it was afterwards publicized by monetary economists. Having realized the functions of monetary policy especially on macroeconomic goals which include development and growth of the economy such as the creation of job opportunities, price stability, increase in Gross Domestic Production (GDP), the balance of payments equilibrium and many more, the bodies responsible for monetary policies have a primary duty of formulating and implementing policies aimed towards balancing the economy.

Definitions have the concept of monetary policy have emerged through various studies. Abiodun and Ogun (2019) defined monetary policy as a calculated or measured strategy undertaken by monetary policy formulators used in regulating the value, supply and capital cost to achieve specific macroeconomic goals in an economy. As defined by CBN (2006), monetary policy is any policy tool planned by the federal government through the CBN to regulate cost availability and supply of credit. It can be said as the control of interest rate and money supply by the CBN to regulate inflation and ensure the stability of the flow of currency in an economy. Jhingan (2011), opined that monetary policy is a credit strategy implemented by the apex bank of a nation. It is also the fusion of tools deliberately put in place to control the value, supply and capital cost following the processes in an economy. It may be defined as the means of directing the motion of financial and investment tools towards achieving economic growth and stability in price in an economy (CBN, 2017). According to Abeng (2006), it was expounded that it is only an economy that uses money as its currency that has validity to implement monetary policy, exceptions to these will jeopardize the effectiveness of the monetary policy. Citing an example, ina less developed economy whose subsistence industry produces the majority of its products, the supply of money tend to be autonomous, monetary policy cannot be recommended for such an economy.

It can be deduced from the above-mentioned definitions that monetary policy shows that monetary policy is majorly a tool in an economy used to regulate the supply of money to attain calculated macroeconomic goals and stability of the economy. Consensus has been reached by a slew of economists that the long-term productivity generally determined by gross domestic product is constant, therefore, variation in the supply of money causesa price change. While price changeframe, changes do not often occur in prices and wages, variation in the supply of money may influence the real manufacture of products and services (Chavula, 2016).

Targets of monetary policy are three, according to CBN (2014): the operational; intermediate and ultimate targets. Operational targets are mostly the instruments such as open market operation,

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cash reserve ratio and liquidity ratio, which are used to achieve the intermediate target (money supply, exchange rate and interest rate).These will finally lead to the realization of predetermined macroeconomic goals such as economic growth, reduced inflation and unemployment rate among others, which are the ultimate targets.

2.1.7 Trade Openness

There are diverse definitions for trade openness, for instance, as regards trade to GDP ratio; no barriers to foreign investment; reduced maximum tariff barriers; export subsidies, cropped import quotas; government procurement procedures; and so on. Ishola et al. (2013) opined that trade openness is a trade policy that fosters the circulation of products and services without hindrance from government-enforced constraints such as regulatory legislation and quotas, high taxes, and tariffs. Saibu (2004) suggested that the rate of export or import to a country's GDP can be considered as trade openness.

Christopher and Damilola (2014) postulated that a mechanism that can be used to measure a country's international competitiveness in the international market is trade openness and it can be calculated by adding the ratio of exports and imports over the economy's GDP. The following are considered as trade openness; exchange-rate policies, import, export taxes, domestic taxes and subsidies, education policies, competition and other regulatory policies, the type of the legal system, the system of government practised, and the overall type of institution and culture.

2.1.8 Nigeria Trade Policies

The aim of Nigeria's trade policies, which have been on a shot-run, has been to secure a balance of payment equilibrium and promote exportation. Industrialization policy, self-sufficiency policies and creation of employment are also some of its uses. Analogbei(2000), divides Nigeria's trade policies into pre- Structural Adjustment Program (SAP) era and post-SAP era policies. At independence, Nigerian's economy was essentially based on agriculture with a sparse industrial sector. To advance the industrial sector (particularly for domestic commodities), a development strategy was drafted. To achieve the expansion of Nigeria's industrial sector and its finance importation, thorough export of cash crops kicked off. To ensure the readiness of external markets of farmers for cash crops like cocoa, groundnuts, palm produce, rubber, ginger, and so on, marketing committees were created. Some other solid minerals that were exported include; tin and coal. The haste to achieve rapid industrial development resulted in higher demands for imported goods which incurred the balance of payments issue. To lessen compression on the BOP, measures such as exchange control methods, import tariffs, import licensing which affected industrialization policy, a bigoted custom tariff structure, and import prescription were put in place.

The 1970–1974 national development plan was the second which was put in place to propel economic growth through the rejuvenation of assets lost to the civil war and the renovation of the industrial facility along

with ascertaining fair allocation of benefits gained from the initiated plan. This development strategy has an additional purpose, which is to integrate and foster the areas of importance of the 1962 to 1968 strategy. But, because of consistent tension on the BOP, limiting trade measures were still reserved and tightened. In the middle of executing this strategy, the price for crude oil in the international market geared up in 1973,which led to excess funds in which Nigeria had no direct domestic investment channel as a result of the nation's small assimilative ability. This subsequently resulted in the alleviation of exchange control regulations (CBN, 1979). The National Development Plan of 1975 to 1980 got instituted during the oil boom though it was strategically planned to foster income from the oil sector, trade policies were thereby eased (Analogbei, 2000).

The next National Development Plan from 1981 to 1985 was introduced at a time of decline in foreign exchange income because of the oil shock Nigeria was experiencing. An increase in demand for importation led to a decrease in external reserves. Thereafter, the state of Balance of Payment degenerated and severer trade constraints were applied though the effectiveness of this strategy was not assuring because the situation that required its implementation continued. Liberalization of trade and pricing systems were features of trade policies enacted in the SAP era, while the main focus was proper pricing techniques for foreign exchange allocation. Another level that embodies market authority in the foreign exchange regime was established to decide the exchange rate. Licenses to export and import were eliminated, exportation was stimulated and bottlenecks such as the constraint that the CBN must collect profits from exporters was abolished; exporters' domiciliary accounts creation were supported; reviewed duty suspension structure was established; the Export Incentive and Miscellaneous Provisions Decree of 1986, the Nigerian Export Credit Guarantee and the Insurance Corporation of 1988 (now Nigerian Export-Import Bank-NEXIM) were instituted. Trade policies in the post-SAP opened trade through the usage of customs tariffs instead of import-licensing constraints. More so, the prohibition list gradually reduced. In all, the era of trade policy in Nigeria was properly categorized and created on the approaches used from 1970–1973, 1974–1979, 1980–1985, 1986–1993, and 1994–1999. The recent policy of, closure of all land borders with neighbouringcountries in August 2019 and reopening in December 2020, was not out of the lots of policies put in place on trade openness (Babalola&Olasupo, 2020).

2.2 Theoretical Review

The basic theories of trade openness are those of the Absolute and Comparative theories of David Ricardo, and the Neo-Classical theory popularly known as the Hecksher-Ohlin theory of trade.The absolute advantage explains that a country should produce those goods it has the opportunity of using less a given resources than a competing country,

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while the comparative cost advantage postulates the capability of a country to produce and export goods/services at a lower marginal and opportunity cost over another country (Ricardo, 1817; Krugman, 1996).

The Hecksher-Ohlin theory asserts that the basis of international trade is due to the gap in labour productivity which is in form of technological and factor supplies differences. It further explains why countries with a shortage supply of one factor have to trade with countries with abundant supply. Therefore, the need for trade openness among nations.

More theories on the study are those of the general Classical, Keynesian and Monetarist views of monetary policy as it affects the real sector of the economy. The classical economist believes that monetary policy is neutral in affecting the real sector of the economy in both the short run and long run, except that, it has a directly proportionate relationship with the price level. The Keynesians believe that monetary policy (money supply) is non-neutral. It can affect the real sector, in which trade openness is part, of the economy in both short-run and long-run periods, except in two extreme cases: When the economy is at full employment equilibrium; and at the liquidity trap region.

The Monetarists submit that, in the short run, monetary policy is neutral, while it can influence the real sector in the long run period (Jhingan, 2011).As applicable to the Monetarist school of thought, Friedman (1963) emphasized money supply as an important element that affects the economy's welfare and also, stated that to stabilize the economy, an active monetary policy is required. He postulates the idea that to encourage a stable growth rate, the supply of money should increase at a constant rate, contrary to its alterations and regulations by monetary policy forces. He also debated that, the demand for supply of money can be for other purposes against its expected trade, he offered that it can be in diverse forms including money, equities, bonds, tangible products and human resources.

2.3 Empirical Review

There are very scanty studies on the topic. The most recent topic on this is that of Chiaraah (2019) which studied the association between trade openness and monetary policy in reducing the inflation rate and improving local output in Ghana. Employing co-integration technique on quarterly data between 2002 and 2016, the finding revealed that as the magnitude of trade openness improves, the effectiveness of monetary policy in reducing the rate of inflation becomes weak and causes local output to reduce in the long-term. The work of Chiaraah (2019) is quite different from the aim of this work because his work is mainly investigating the effect of monetary policy and trade openness on inflation and output. This study is investigating the effect of monetary policy on trade openness.

Similar to the work of Chiaraah (2019), was the study of Ahiakpor, Cantah and Brafu-Insaidoo (2019), who employed a Structural VAR model, on data from 2002 to 2017 to

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assess the relationship between trade openness and the effectiveness of the monetary policy, also in Ghana. The empirical results revealed that as the degree of trade openness increases, monetary policy becomes more effective in reducing the rate of inflation. Nevertheless, monetary policy was less effective in improving total output.

Ajayi and Araoye (2019) investigated the impact of liberationist policy on Nigeria's economy utilizing 1970-2016 data, The Co-integration test revealed that a balanced link is present amid the variations. Hence, the coefficients present were rightly stationed at the 5per cent level. A good connection exists between economic growth and trade openness but the reverse is the case with the exchange rate and economic growth though this is foreseen particularly in countries involved in an international transaction. Though this work was recent, it did not employ the correct technique for impact analysis as cointegration would only explain the existence of a long-run relationship in a model. More so, the researchers did not investigate the effect of monetary policy on trade openness in Nigeria. Another query is that the period of analysis was mixed.

Sunday and Ahmed (2019) empirically probed the distinguishing effect of liberationist policy on Nigerian economy growth dating from 1980 to 2016. The diagnostic test carried out were: cointegration test, error correction model and unit root test. The deduction from the outcome showed that in both the short and long term, the effect of trade openness on Nigeria's economy was negative. The work is quite similar to that of Ajayi and Araoye (2019), but different from this work in that, trade openness is put as the dependent variable, and the period is not mixed between pre-SAP and post-SAP periods. Thus, the previous papers might have encountered a structural break in their analysis but not captured in the techniques used.

Applying secondary data from 1975-2017, Ijirshar (2019) examined the effect of liberationist policy on economic growth among ECOWAS nations. The research implements different moveable dynamic panel models via the use of Pooled Mean Group (PMG) and Mean Group (MG) measures because time dimension surpasses cross-sections. Utilizing the Hausman test, the PMG estimator was indorsed. The outcome revealed that in a short term, ECOWAS nations experience a constructive effect on their economic growth but a mixture of positive and negative in the long term. This is a panel analysis due to the cross-sectional and time-series used for many countries.

Nura and Amina (2018) examinedthe impact of trade openness on Nigeria's economic growth inthelong term using interval data from 1986-2016. Applying the Johansen cointegration method, the research got proof of co-stationary on a long-term between economic growth, trade openness and exchange rate as the variables of interest are revealed to be co-incorporated. Applying Fully Modified Ordinary Least Square (FMOLS) and Dynamic OLS regression methods, the researchers discovered the proof to imply that trade openness has a vital constructive effect on economic growth. This

means that, until there is diversification of Nigeria's production industry, trade openness' effect in the long term on the economy will always infuse weakness to its growth. The result also revealsthat the exchange rate has an inverse relationship with economic growth in the long run, but the effect is statistically insignificant. The issue of the study is not different from the previous with the dependent variable being economic growth and trade openness being put as the independent variable.

Ekpo and Effiong (2017) researched the relationship between openness to trade and the influenceof monetary policy on growth and inflation in Africa. It is claimed that the effectiveness of monetary policy is facilitated according to the length of openness to international trade. Standard panel data methods were applied using annual data from 1990 to 2015 for a panel of 37 African nations and discovered a sturdy vital connection between openness to trade and the effectiveness of monetary policy in Africa. The outcomes show that monetary policy's effect on productivity growth and inflation rises and falls accordingly with a heightened degree of trade openness.

Zahonogo (2017) studied the causal effect of trade on economic growth in evolving economies via nations in Sub-Saharan Africa. Dynamic growth model was applied using 42 Sub-Saharan African nation's data of 1980 - 2012. The study made use of Pooled Mean Group and the outcome indicated that a trade verge exists. Below this verge, greater trade openness is of positive impact on economic growth but above the verge, the impact declines.

Iyoha and Okim (2017), examined the influence of trade openness on ECOWAS nations' economic growth using panel data between 1990 and 2013. The study made use of four estimators, namely; Dynamic Panel Regression model, Pooled OLS, Random-effects model, and Fixed-effects model, and though the problem of endogeneity was tackled by dynamic panel data estimator. The study discover that exportation, investment and exchange rate were vital determining factors of increase per capita of actual revenue and that exports were constantly constructively linked to growth, insinuating that trade openness is of constructive influence on ECOWAS nations' economic growth. The inadequacies in this research, however, is that it failed to cover analysis and specifications for selecting between Pooled Mean Group estimator and Mean Group estimator via the use of the Hausman test which would have deliberated on the significance of the estimated coefficients differences if it were methodical or not.

Anowor and Okorie (2016) experimentally reevaluated the influence of monetary policy on Nigeria's economic growth while using the Error Correction Model technique. The study made use of time interval secondary data which covers 1982 to 2013. The outcome of the study revealed that an increase in a unit Cash Reserve Ratio (CRR) incurs an increase in about seven units in Nigeria's economic growth. The result aligned with economic literature as monetary policy among other objectives is geared

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towards achieving the macroeconomic objectives of sustained economic growth and price stability. This work is similar but did not treat trade openness at all. It has also used operational instruments to capture monetary policy. This study is different as it used intermediate instruments to proxy monetary policy.

Ude and Agodi (2015) investigated the sense of trade openness as it affects economic growth in Nigeria.Using Generalized Autoregressive Conditional Heteroscedasticity (GARCH) and Pairwise-Granger causality as tools for analysis on time series data between 1984 and 2013, their finding divulged that trade openness has a significant impact on economic growth. They concluded that trade openness makes sense in Nigeria.

Christopher and Damilola (2014) considered the relative relationship between trade openness and output growth in Nigeriabetween 1970 and 2010. Non-Monotonic modelling and Ordinary Least Square (OLS) wereutilised as the estimation tools. Their finding indicateda positive relationship between trade openness and output growth in Nigeria.

2.4Conceptual Framework

Based on previous literature and the relationship those exist between monetary policy and trade openness the conceptual framework for this study is formulated below. The dependent variable is trade openness is expressed as the ratio of import to export in an economy that is affected by each of the policies at the disposal of the central bank for regulatory purposes. Some of the major monetary policies instruments that directly affect trade openness are exchange rate, interest rate, and money. This instrument tends to have a direct effect on the country's balance of trade, the attraction of foreign direct investment and the country's external reserve. The diagrammatic representation of the framework is therefore shown in figure 1.

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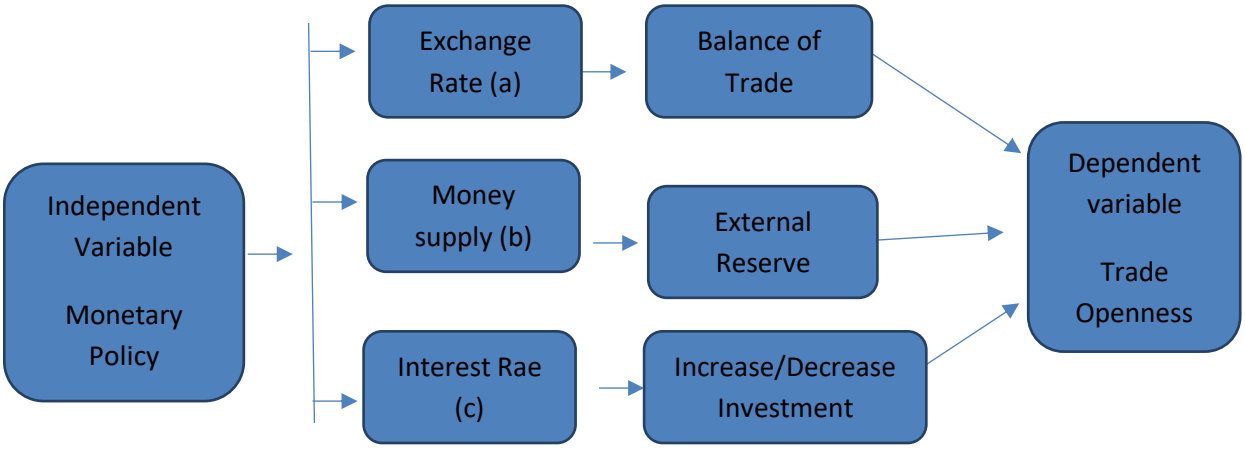

Source: Authors computation (2021).

Figure 1: Framework of Transmission Mechanism of Monetary Policy

In Figure 1, when the monetary authority makes a contractionary monetary policy, for instance, it makes interest rate (c) increase and the cost of investment becomes high and investors are discouraged from investing. Production of goods will be low and thus, trade openness is affected. Money supply (b) reduction will lead to less quantity of money in circulation which will make obtaining loans for investment very difficult, thereby further making investment tough. This will have an adverse effect on trade openness. Exchange rate (a) will affect the balance of trade which will have an impact on trade openness. When the exchange rate is high (dearer), the trade will be discouraged especially the importation, which will affect the international trade balance.

2.5 Theoretical Framework

Here, the concern is to see how the transmission mechanism goes with the Heckscher-Ohlin theory. The chat in Figure 2 explains this transmission

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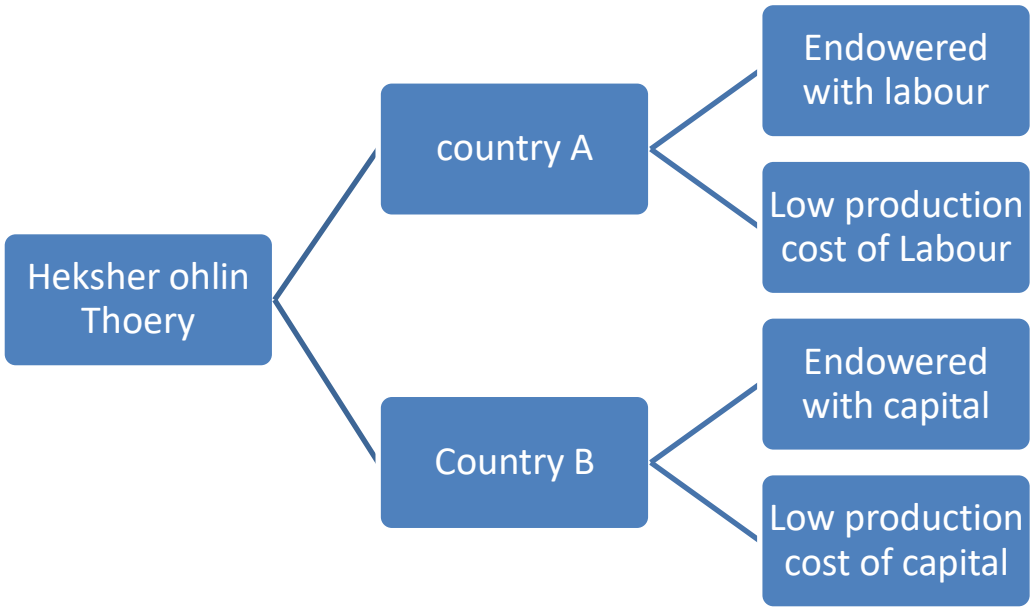

Source: Authors computation (2021).

Figure 2: Fig 2.0: Diagrammatic of Hecksher-Ohlin Theory of International Trade.

Figure 2 shows a basic representation of two identical countries (A and B) with different initial factor endowments. Initially, with no trade, individual production equals consumption. Country A is endowed with labour resources while country B is more endowed with capital. According to H-O theory, when each of the countries will engage in international trade, they should focus on goods that give them a comparative advantage i.e. each of the countries should major in goods that gives the least cost of production

2.7 Research Gap

Having critical examined different literature and studies that have explored the topic of concern in this study, it was observed that several studies have only examined trade openness and its contribution to economic growth while some other studies examine the combined effect of fiscal and monetary policy on trade openness. Furthermore, the few studies that solely explore the individual monetary policy and their causality on trade openness and the few could not adopt a robust econometrics method of estimation, thus a methodology gap.None of them has studied the impact of monetary policy on trade openness so far. Therefore, this study will be filling the gap of updating existing literature, examining the effect of each of the monetary policy tools (money supply, lending rate and exchange rate) on Nigeria's trade openness as well as adopting a seasoned econometric technique to measure the effect of monetary policy on Nigeria's trade openness.

3.0 Methodology

3.1 Model Specification

To investigate the impact of monetary policy on trade openness, this study adapted the

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work of Chiarahh (2019), by placing trade openness as the dependent variable while the intermediate monetary policy targets (broad money supply growth, lending rate and exchange rate) stood as the explanatory variable, as

$$TOP = f(M2, LR, EXR) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

Expressing equation (1) in its explicit econometric form, it becomes:

$$TOP = \alpha_0 + \alpha_1 M2 + \alpha_2 LR + \alpha_3 EXR + \mu \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(2)$$

Where:

TOP = Trade openness

M2= Broad money supply growth

LR = Lending rate

EXR = Exchange rate

μ_t = Error term, α_0= intercept and $\alpha_1 - \alpha_3$= Slopes, and they are the also to be estimated.

The *a priopi* expectation is that, when the money supply grows in the economy, demand and investment will increase, and it will increase the quantity of aggregate demand and thus, trade openness will improve. Therefore, it has a positive impact on trade openness. This is represented algebraically as:

$$\frac{\partial TOP}{\partial M2} > 0$$

More so, when the lending rate reduces, more investors will see it as a reduction in the cost of investment and so, it will boost investment and supply will be increased as well as the trade openness since more goods would be traded outside the country. Hence, the impact of lending rate on trade openness is expected to be inverse, as:

$$\frac{\partial TOP}{\partial LR} < 0$$

When the exchange rate is high, it means the value of the home currency is low. More goods will be demanded by foreigners, *ceteris paribus* since the goods will be cheap. Therefore, it is expected to have a positive impact on trade openness. Algebraically, it will be

$$\frac{\partial TOP}{\partial EXR} > 0$$

3.2Measurement of Variables

Trade Openness (TOP): This is the ratio of the sum of imports and exports to the nation's gross domestic product.

Exchange Rate (EXR): The official rate at which the Nigerian Naira is exchanged for one US dollar.

Lending rate (LR): This is the rate at which commercial banks lend out money to investors. The prime lending rate is utilized in this study.

Broad Money Supply Growth (M2): This is growth in the broad money supply. It is expressed as a percentage change in the broad money supply (M2).

3.3 Source of Data

The timeframe of this research spannedfrom 1987 to 2020 and is selected due to the history of Nigeria's economy. This timeframe experienced a significant change in Nigeria's economic history as it was a period when major monetary policies were made to boost the country's economy, most

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especially the liberalization. Apart from this, this was a period when Nigeria signed several treaties and international trade pacts with WTI, IMF and ECOWAS. This research will implement statistical data gotten from World Development Indicators (2020).

3.4 Estimation Techniques

The main techniques of analysis for this study were the Cointegration and Vector Auto-Regressive (VAR)/Error Correction Model (ECM) and Granger Causality, which constituted the Estimation Techniques. Pre-estimation tools would be the descriptive, correlation and unit root test statistics. Finally, the post-estimation techniques would showcase the residual diagnostic tests and stability tests of the model. All these analyses have paramount importance to the study. The choice of this method was informed by the result of the unit root tests in which all variables were integrated of order one. This method would be adequate as it divulged the short-run and long-run effects of monetary policy on trade openness in Nigeria.

4.0 Empirical Findings

4.1.0 Results of Pre-Estimation Analysis

4.1.1 Descriptive Statistics

Table 1 presents the descriptive statistics which explains the status of each variable used in the study. EXR (Exchange rate) has the highest mean of 121.05 followed by TOP (trade Openness with 52.16 and then M_2 and LR with 25.56 and 19.05 respectively. The median follows the same positioning as the mean. However, the standard deviation (from the mean) is lowest in LR (lending rate) followed by TOP and then M_2. All the variables appear to be positively skewed except TOP which is negative. The kurtosis figures indicate that M_2 and EXR (3.03 and 3.27) are both Mesokurtic, while TOP (2.10) and LR (5.4) are Platykurtic and Leptykurtic respectively.

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Table 1: Descriptive Statistics Results

	M2	TOP	LR	EXR
Mean	25.56347	52.15592	19.04875	121.0480
Median	20.67703	55.84639	17.94833	120.5782
Maximum	64.92465	81.81285	31.65000	379.5500
Minimum	1.387829	20.72000	13.64202	4.016037
Std. Dev.	16.81542	16.14979	3.702924	110.2676
Skewness	0.912884	-0.241105	1.383006	1.011594
Kurtosis	3.026725	2.102391	5.395141	3.272344
Jarque-Bera	4.584451	1.427564	18.40784	5.730263
Probability	0.101041	0.489788	0.000101	0.056976
Sum	843.5946	1721.146	628.6087	3994.585
Sum Sq. Dev.	9048.268	8346.104	438.7726	389086.5
Observations	33	33	33	33

Source: Author's Extraction from E-Views Analysis, 2021.

The Jarque-Berra statistics, which explains how normally distributed a variable is, given its null hypothesis to be normality distributed, shows, in the result, that all the variables are normally distributed except LR. This conclusion is shown in their probability values, which indicate that the null hypotheses of M_2, TOP and EXR, be

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accepted since their probabilities are more than 5per cent (10.1per cent, 49per cent, 57per cent).

4.1.2 Pairwise Correlation Matrix

This statistics is important to ascertain the presence or absence of multicollinearity in the explanatory variables. Table 2 shows the pairwise correlation between variables. The pairwise relationship between the explanatory variables (M_2, LR and EXR) shows less than 0.5 which is far less than the threshold of high correlation (0.8 and above).

Table 2: Pairwise Correlation Matrix

	M2	TOP	LR	EXR
M2	1			
TOP	0.3949	1		
LR	0.3871	0.4564	1	
EXR	-0.4142	-0.5778	-0.4617	1

Source: Author's Extraction from E-Views Analysis, 2021.

This means that the explanatory variables are not highly correlated and thus it is concluded that there is no presence of multicollinearity in the explanatory variables, hence, the model.

4.1.3 Result of Unit Root Test

The result of two statistical tests (ADF and PP) of the unit root is presented in Table 3. Their respective p-values suggest that the null hypothesis of non-stationarity be accepted as they all have more than a 5per cent level of significance. Therefore, it is concluded that the variables are not stationary at level.

Table 4 present the test again at first difference, using ADF and PP tests, the result in table 4 shows that all variables are stationary at first difference because their respective p-values are less than 5per cent which suggest that the null hypotheses (of non-stationary) be rejected.

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Table 3: Result of Unit Root Test (At Level)

Series	ADF(Prob.)	PP(Prob.)	Remarks
M2	0.0582	0.0944	Non-Stationary
TOP	0.1691	0.2288	Non-Stationary
LR	0.0816	0.0541	Non-Stationary
EXR	0.9841	0.9978	Non-Stationary

Source: Author's Extraction from E-Views Analysis, 2021.

Conclusively, since all the variables are integrated of the same order one (I(1)). It suggests that the best technique of analysis be the Vector Auto-Regressive (VAR) Model.

Table 4: Result of Unit Root Test (At First Difference)

Series	ADF(Prob.)	PP(Prob.)	Remarks
D(M2)	0.0000	0.0000	Stationary
D(TOP)	0.0000	0.0000	Stationary
D(LR)	0.0000	0.0000	Stationary
D(EXR)	0.0132	0.0144	Stationary

Source: Author's Extraction from E-Views Analysis, 2021.

4.2 Results of estimation Analysis

4.2.1 Lag Selection Order

Table 5 showcases the outcome of lag selection order for the best lag. Four out of the five criteria indicate that the best selection is lag 1, therefore, this study would employ the lag 1 for its analysis.

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Table 5: Lag Selection Order

Lag	LogL	LR	FPE	AIC	SC	HQ
1	-331.8540	NA	1.63e+08 *	30.24818 *	31.03808 *	30.44684 *
2	-321.4202	13.60930	2.95e+08	30.73219	32.31201	31.12951
3	-309.2728	11.61931	5.76e+08	31.06720	33.43692	31.66318
4	-289.2487	12.18856	9.49e+08	30.71728	33.87691	31.51192
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion						
HQ: Hannan-Quinn information criterion						

Source: Author's Extraction from E-Views Analysis, 2021.

4.2.2 Result of Cointegration Analysis

The Johansen Cointegration Technique using the Trace and Maximum Eigenvalue statistics were employed to test for the long-run relationship in the model. These results are presented in Tables 6 and 7. From Table 6, the Trace test indicates that there exist four cointegrating equations in the model since their values are less than 0.05.

Table 6: Johansen Cointegration Test (Trace)

Hypothesized	Trace	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.665444	61.11910	47.85613	0.0018
At most 1 *	0.512608	33.74534	29.79707	0.0167
At most 2 *	0.370448	15.77818	15.49471	0.0453
At most 3 *	0.154968	4.209513	3.841466	0.0402

Source: Author's Extraction from E-Views Analysis, 2021.

This result is further supported given the Maximum-Eigen value test result in Table 7. It suggests that there is a cointegrating equation as its p-valueis less than 0.05

(0.0402).Summarily, the two tests statistics informed the study that there exists a long-run relationship in the model and thus, the Error Correction Mechanism (ECM) could be employed.

Table 7: Johansen Cointegration Test (Maximum Eigenvalue)

Hypothesized	Max-Eigen	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.665444	27.37376	27.58434	0.0532
At most 1	0.512608	17.96716	21.13162	0.1311
At most 2	0.370448	11.56867	14.26460	0.1279
At most 3 *	0.154968	4.209513	3.841466	0.0402

Source: Author's Extraction from E-Views Analysis, 2021.

4.2.3 Result of Short-Run and ECM Coefficients.

The result in Table 8 presents the short-run and Error Correction Mechanism (ECM) of the model. Being particular in the second column from the left, the result shows that, broad money supply (M2) and lending rate (LR) have the correct positive and negative signs in line with *a priori* expectation. Both of the variables have a significant impact on trade openness (TOP), as their t-values (2.45 and -2.3) indicate. This means that a unit increase in money supply growth (M2), on average, will lead to 0.38 unit increase in trade openness. This result is in line with the work of Ekpo and Effiong (2017) in the African region, but against the findings of Chiaraah (2019) in Ghana.

Table 8: Short-Run and ECM Coefficients

Error Correction:	D(DTOP)	D(DEXR)	D(DLR)	D(DM2)
CointEq1	-0.258496	0.414488	0.220399	-0.244578
	(0.19386)	(0.26061)	(0.04540)	(0.24605)
	[-1.33343]	[1.59044]	[4.85416]	[-0.99401]
D(DTOP(-1))	-0.400391	-0.566128	-0.081423	0.379260
	(0.18961)	(0.25490)	(0.04441)	(0.24066)
	[-2.11164]	[-2.22096]	[-1.83346]	[1.57592]

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D(DEXR(-1))	0.121555	-0.444184	0.021726	0.286473
	(0.13160)	(0.17691)	(0.03082)	(0.16702)
	[0.92370]	[-2.51080]	[0.70489]	[1.71516]
D(DLR(-1))	-1.710458	1.250511	0.075509	-1.351476
	(0.74358)	(0.99963)	(0.17416)	(0.94377)
	[-2.30030]	[1.25098]	[0.43357]	[-1.43200]
D(DM2(-1))	0.383920	-0.485384	-0.057706	-0.079687
	(0.15652)	(0.21041)	(0.03666)	(0.19866)
	[2.45288]	[-2.30681]	[-1.57416]	[-0.40113]
C	-1.736676	-1.527522	-0.131468	0.886809
	(2.83040)	(3.80503)	(0.66292)	(3.59242)
	[-0.61358]	[-0.40145]	[-0.19832]	[0.24686]
R-squared	0.612356	0.348214	0.671870	0.305794
Adj. R-squared	0.520060	0.193026	0.593744	0.140506

Source: Author's Extraction from E-Views Analysis, 2021.

Also, a unit increase in lending rate, on averagely, leads to a 1.71 unit decrease in trade openness in Nigeria, in the short run. However, the exchange rate (EXR) has a positive sign but could not have any significant impact on trade openness, as its standard error (0.13) is too large and t-value (0.92) is too small. ECM coefficient shows the correct negative sign but could not be significant, meaning that the switch between the short-run and long-run periods in the model could not be significant.

4.2.4 Result of Long-Run Coefficients

In the long run, as shown in Table 9,broad money supply growth and lending rate have the expected signs and they are significant at 5per cent and 1per cent levels. However, the exchange rate could not be significant. Since M2 and LR are significant in the long run, the study concludes that monetary policy has a significant impact on trade openness in Nigeria in the long run. The finding is in deviance with the work of Ahiakpor, Cantah and Brafu-Insaidoo (2019).

Table 9: Long-Run Coefficients

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Variables	Coefficients	Standard Error	t-statistics
DTOP(-1)	1.000000		
DEXR(-1)	0.143655	0.20235	0.70993
DLR(-1)	-6.279255	1.18307	-5.30758
DM2(-1)	0.535487	0.21052	2.54368
C	-1.255362		

Source: Author's Extraction from E-Views Analysis, 2021.

4.2.5 Result of VEC Granger Causality Test (Individual and Joint Tests)

The result of the Granger causality test is presented in Table 10. It consists of both joint and individual variable causalities. The result of the joint causality shows that all the variables jointly granger cause trade openness, according to the probability value (0.0427). However, the individual result shows that only M2 and LR granger cause trade openness, as their probability values (0.36, 0.02 and 0.1) indicate. Hence, the study concludes that monetary policy granger causes trade openness in Nigeria. This result was supported with the findings of Ekpo and Effiong (2017).

Table 10: VEC Granger Causality Test

Dependent variable: D(DTOP)			
Excluded	Chi-sq	Df	Prob.
D(DEXR)	0.853224	1	0.3556
D(DLR)	5.291392	1	0.0214
D(DM2)	6.016624	1	0.0142
All	25.20267	3	0.0427

Source: Author's Extraction from E-Views Analysis, 2021.

4.3 Post-Estimation Analysis

4.3.1 Result of Residual Tests

Table 11 presents the diagnostic test result of the residual in the model. Using the p-values of the three test statistics, the null hypotheses are accepted that, there is no presence of serial correlation and heteroskedasticity in the model, and generally, the variables are normally distributed.

Table 11: Result of Residual Tests

Diagnosis	Statistics	Probability
Serial Correlation	13.79766	0.6138
Heteroskedasticity	179.3897	0.4988
Normality	0.026440	0.8708

Source: Author's Extraction from E-Views Analysis, 2021.

4.3.2 Result of Stability Tests

Figure 1 showcases the stability results for the model. As could be seen in the figure, all the dots are within the circle, which implies that the model is stable and consistent for use.

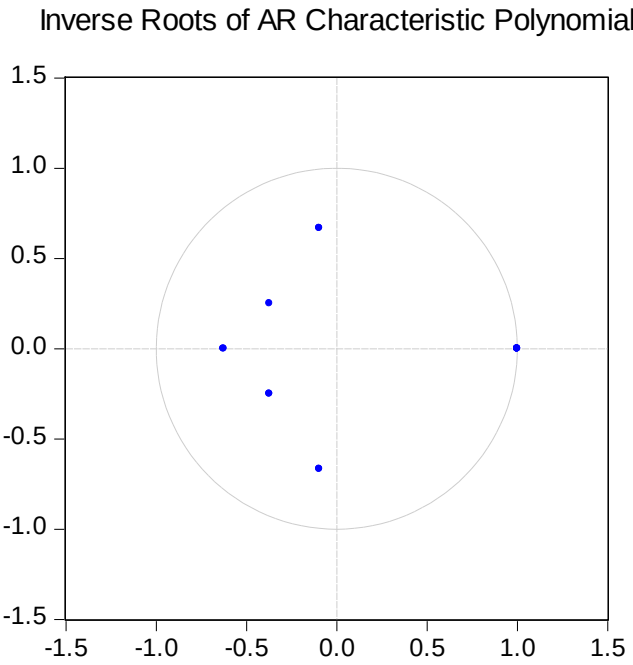

Figure 1: Stability Test

5. Conclusion and Recommendations

This study investigated the impact of monetary policy on trade openness in Nigeria. Haven used broad money growth, lending rate and exchange rates to proxy monetary policy in Nigeria, the study found out the monetary policy has a significant impact on trade openness in both the short-run and long-run periods. Specifically, broad money growth has a direct/ positive impact on trade openness while lending rate has an inverse impact influence on trade openness. However, the exchange rate does not have any significant impact on trade openness in Nigeria.

Based on the findings and conclusion of this study, it is suggested that monetary policy be used to boost the economy's trade openness by increasing the broad money growth and reducing the lending rate which could improve quality investments for export.

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Causes and effects of land conflicts on crop production in Lapai and Lavun local Government areas of Niger state, Nigeria

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Abstract

This study analyzed the causes and effects of land conflicts on crop production in Lapai and Lavun local Government areas of Niger state, Nigeria. A random sampling technique was adopted in sampling of 154 respondents used for the study. Data were collected with a structured questionnaire and were analyzed using descriptive statistics and regression models. Results showed that the modal age of the respondents was 51 to 60 years an indication that majority of the youths have migrated from rural areas to urban areas as a result of land conflicts in search of greener pastures leaving older people to do farming.Inheritance system of land tenure system is the major source of land for farming activities in the area (62.6%). The source of acquisition of land for farming activities do affect the types of crop cultivated and scale of farming enterprises. The average farm size of the respondents was 2.6 ha. This is an indication that majority of the farmers in the study area were peasant farmers practicing subsistence agriculture. The major causes of land conflict in the area were failure to respect farm boundaries ($\bar{x}$=10.4), contesting the inheritance of the land ($\bar{x}$=12.9), destruction of farm crops by grazing animal ($\bar{x}$=11.9) and abandonment of previously accepted rules of access to and use of land ($\bar{x}$=8.7).The regression coefficients of fertilizer is positive and statistically significant at 1%, which implies that an increase in fertilizer have direct influence on the output of farmers. Reduction in output and income of crop farmers as a result of the destruction of crops during crisis is the most prevalence of the effect. The study therefore, recommended thatIndividual and community farm boundaries should be respected to avoid litigations, which could lead to wastage of resources and loss of manpower.

Key words: land, conflict,crop,production.

Introduction

Land is very important factor in Agricultural production in Nigeria. About 40% of the total population or almost 83 million people live below the poverty line of 137,430 naira ($381.75) per year and 53.18% of this poor live in rural areas and drive their livelihood from land (NBS, 2020). Today, land conflicts, high rural poverty levels, increasing population densities and declining land fertility represent an enormous agricultural and environmental policy

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challenge in Nigeria, particularly Niger State with poverty rate of 66.11% (NBS, 2019). It is clear that substantial rural poverty reduction can only be achieved if Agricultural productivity is improved through crop production and land resources conserved.

Land is central to agriculture and livestock production, as it is to all economic activities. Land resources include soil, water, vegetation and other aquatic resources. Land can be defined as vital natural resources that hosts and sustains all living things namely: plants, animal and man. It is a fixed socio economic asset that aids production of goods and services and virtually all activities that take place on earth (Deogratias, 2013). Conflict is not a new phenomenon but rather a problem that grows with time. Batubo (2010) considered conflict as a relationship between two or more parties who believe they have incompatible goals or interests. It could be as a result of misunderstanding that involves negotiable interests which could be religious, social, political or economic interest.

A land conflict therefore, can be understood as a mis-use, restriction or dispute over property rights to land (Wehrmann, 2015). These conflicts significantly vary in dimension, process and the groups involved. Some conflicts arise between similar resources users such as between one farming community and another while others occur between different resources users such as between pastoralist and farmers or between foresters and farmers (Abegunde, 2019). Similarly, some are volatile while some are non-volatile resulting into armed clashes between groups and usually resulted into loss of life.

Land ownership is a sign of economic power and social standing. In the process of utilizing land resources for the diverse complex and competing social-economic activities of the people, conflicts over access and management of these resources often arise. Conflict is define by Omotara, (2016) as a social fact in which at least two parties are involved and whose origins differs either in interests or in the social position of the partners.

One of the major problems facing rural households is conflict over land with relatives or neigbours. As in other States in Nigeria, land is considered a very sensitive matter in Niger State. Land conflicts are handled either through the formal legal or the customary dispute resolution systems. However, due to inefficiencies in these land dispute resolution mechanisms, small-scale land conflicts persist.Land is increasingly becoming a source of conflicts in Nigeria and Africa at large where land access had traditionally been characterized as relatively unrestricted. During conflicts, activities of rural residents are usually affected but to which extent does it affects the farmers crop productivity, socially and economically in Niger state is what this studyexamined.

Materials and Methods

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Study Area

Lapai and Lavun are local Government areas of Niger state, Nigeria created in 1976, by the then military head of state Late Gen Murtala Ramat Mohammad. The State is located in the North Central Zone of the country. The State has a projected population of 5,556,200 (population census 2016). The state is ranked 18th of the 36 in terms of population density. The state lies between latitudes $6^0.30^{'}$N and $11^0.20$'N and longitude $2^0.30^{'}$E and $10^0.30$'E occupying a land mass of about 76,363km^2 (Nipost, 2019), making it the largest state in the country in terms of land mass. Niger State share common boundaries with Kaduna state to the North-East, FCT to the South – East, Zamfara State boarders the North, Kebbi State in the West, Kogi State to the South and kwara State to the South West respectively.

Niger State presently has twenty-five (25) Local government and Minna being the state capital. The twenty-five (25) local Government are: Agaie, Agwara, Bida, Borgu, Bosso, Chanchaga, Edati, Gbako, Gurara, Katcha, Kontagora, Lapai, Lavun, Magama, Mariga, Mashegu, Mokwa, Muya, Paikoro, Rafi, Rijau, Shiroro, Suleja, Tafa and Wushishi. The state is divided into three (3) Agricultural zones namely: zone 'I', Zone 'II' and zone 'III'. Niger State is the home of the four biggest hydro-power dams in Nigeria namely: Kainji, Shiroro, Jebba and Zungeru dams.

Multistage sampling techniques were used in the selection of respondents for this study. The three Agricultural zones in Niger State namely, Zone I, II, III which reflect the geographical structure of the state were examined. In the first stage, zone I out of the three zones was purposively selected based on the preponderance of land conflict in the zone. This was followed by a random sampling of two Local Governments Area from Zone I (Lapai and Lavun). In the third stage, four (4) villages were randomly selected where the respondents were sampled. The villages selected are Gbami and Edda in Lapai Local Government and Boku and Doko in Lavun Local Government area respectively. In the fourth stage, 61% of the sample frame of respondents was taken because this percentage can represent the whole population. A total of 154 respondents were used for the study at the precision level $(e)^2$ of 0.05.

Fourthly, the sample size of the respondents will be determined from sample frame using (Yamane, 1967; adopted by Umar, 2015). The formula is given as:

$$n = \frac{N}{1} + N\,(e)^2 \qquad (1)$$

$Where, n = Sample\ size\ N$
$= Total\ population\ of\ study\ 1$
$= Constant\ e$
$= limit\ of\ tolerable\ error, for\ this\ study\ (0.05)$

$$\frac{253}{1 + 253(0.0025)} = \frac{253}{1.6325} = n$$
$$= 155\ \frac{155}{253} \times 100 = 61\%$$

Table 1: Summary of the selected study location and distribution of sample size

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Political Zone	LGA	Wards	Sample frame	sample Size from each ward (61% of each SF)
I	Lavun	Doko	91	56
		Boku	78	48
	Lapai	Gbami	65	40
		Edda	18	11
TOTAL			**252**	**155 (61% of SF)**

Source of the sample size: field survey 2021.

Analytical Techniques for data Analysis

The data for this study was analyze using descriptive statistics and multiple regression analysis approaches.

Descriptive statistics

Descriptive statistic tools such as frequency, percentages, mean, standard deviation will be used to identify the socioeconomic characteristics of the crop farmers. Causes of conflicts over farmland will be measured with five-point scale ofStrongly Agree (SA), Agree (A), Neutral (N), Disagree (D), strongly Disagree (SD) and will be scored as 5, 4, 3, 2, and 1 respectively. Ofuoku and Isife(2009) adopted by Omotara, (2016) used a 5-point and 3-point Likert type scale to identifythe main causes of conflict. They measure thecauses by calculating the mean of each variable andthey identified a variable as a major cause if its cutoff score is ≥ 2.50 and minor cause if its mean is ≤2.50. As a result, this study adapt the samemodel to identify the major causes of farmlandconflict using a 5 point scale. Causes of conflictswas categorized into two major cause ≥ 3 andminor cause ≤ 3 using the total score 5+4+3+2+1 = 15divided by total number of scale items which is 5 toobtain 3 which was used as the cut-off point.

Multiple linear regressions Model

Multiple regression analysis was used to analyse the effect of land use conflict on crop production, a multiple regression analysis that took into account a broader set of independent variables by specifying a function of the form:

$$ln\,(\boldsymbol{Y}j) = +\alpha Ci + \boldsymbol{N}j + \alpha\,\boldsymbol{X}i + \alpha ij \ldots\ldots(2)$$

$\mathbf{Y}_j$is crop output per plot (kg/plot)

Ci indicates the conflict status of the plot

$\boldsymbol{N}_j$denotes farmer's characteristics

$\mathbf{X}_i$ denotes plot characteristics

Key elements in $\boldsymbol{N}_j$include:

$\boldsymbol{N}_{j1}$= Age of farmer measured in years

$\boldsymbol{N}_{j2}$= Nature of farming (part-time =1, otherwise =0)

$\boldsymbol{N}_{j3}$= Number of plots owned by farmer

$\boldsymbol{N}_{j4}$= Years of education of farmer

Key elements in $\boldsymbol{X}_i$include:

$\boldsymbol{X}_{i1}$= Distance of each plot to farmer's location of residence in km

$\boldsymbol{X}_{i2}$= Soil Quality (fertile = 1, otherwise = 0)

$C_i$is a dummy variable, which is equal to 1 if conflict is ongoing on plot *j* owned by

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household *i*and 0 if the farmer has never experienced conflict onthe plot or the conflict has been resolved as at the time of data collection.

Result and Discussion

Social-Economic characteristics of the respondents

The socio-economic characteristics of the respondents do greatly affect the behavior of crop farmers in the study area. Some of these characteristics are age, sex, marital status, household size, educational level, farm size, farming experience and sources of land ownership. As shown in Table 2, about (48.4%) of the respondents age was below 50 years while about 51.6% of the respondents were above 50 years. The mean age of the farmers in the study area was 50.02 while 11.02 is the deviation from the mean. The coefficient of variation (CV) is 22% indicating consistency in the percentage deviation from the mean. The modal age of the respondents was 51 to 60 years. This shows that majority of the youths have migrated from rural areas to urban areas as a result of land conflicts in search of greener pastures leaving older people to do farming. This result is similar to the findings of Omotara (2016) on conflicts over farmland and its socioeconomic effects on rural residents of Southwestern Nigeria. Adeogun, Fapojuwo, Oyeyinka, Adamu and Abiona (2013) also discovered that the average age of farmers in cocoa producing areas of Nigeria was 54.4 years. The larger proportions (82.58%) of the respondents were male while 17.42 % were female. Majority (76%) of the respondents had one form of education or the other and only 23.9% had no formal education. The findingsindicate a high level of literacy among therespondents which is expected to translate to betterunderstanding of management and solving landconflicts issues**.**

Inheritance system of land tenure systemis the major source of land for farming activities in the area (62.6%) followed by leasehold (19.4%) and individual ownership (13.6%). The source ofacquisition of land for farming activities do affectthe types of crops cultivated, scale of farmingenterprises and mechanization of farming activities.Larger proportion (54.19%) of the respondents' farm size was between three to four hectares and only10.97% of the respondents had above four hectares.The average farm size of the respondents was 2.62 ha. This is an indication that majority of thefarmers in the study area were peasant farmerspracticing subsistence agriculture. The larger proportion (72.9%) of crop farmers has between 5-15 members of households. In the traditional African society where farming are major occupation, a great deal depend on the size of the household of farmers since the use of traditional methods of farming which is tedious as it requires great human labour is most prevalent. The mean years of farming experience of the respondents was 19.7 years. About 30.3%had between 11-20 years of farming experience,which means that they were very experienced infarming business and would have been familiar with the socio-economic effects of conflicts overfarmland.

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Table 2: Socio economic characteristics of the respondents (n= 155)

Variables	Frequency	Percentage	Parameters
Age (years)			
31-40	32	20.65	
41-50	43	27.74	**Mean = 50.02**
51-60	58	37.42	**SD = 11.20**
>61	22	14.19	**CV = 22.4%**
Sex			
Male	128	82.58	
Female	27	17.42	
Marital status			
Single	52	33.55	
Married	61	39.35	
Divorced	11	7.10	
Widow	31	20.0	
Household size			
1-5	42	27.10	
6-10	37	23.90	
11-15	34	21.90	
16-20	25	16.13	
>20	17	10.97	
Educational level			
No formal education	37	23.87	
Primary education	43	27.74	
Secondary education	27	17.42	
Post-Secondary education	16	10.32	
Qur,anic Education	32	20.65	
Farm size (hectares)			
0.1-1	6	3.87	
1.01-2	21	13.55	**Mean = 2.62**
2.01-3	27	17.42	**SD = 0.51**
3.01-4	84	54.19	**CV = 19.5%**
>4.01	17	10.97	
Farming Experience (years)			
0.1-10	43	27.74	
11-20	47	30.32	**Mean = 19.7**
21-30	32	20.65	**SD = 7.6**
31-40	21	13.55	**CV = 38%**
>41	12	7.74	
Sources of land ownership			
Inheritance	97	62.58	
Leasehold	30	19.35	
Individual	21	13.55	

Gift	7	4.52

Source: Field survey, 2021

Causes of land conflict in the study area

Table 2 reveals that the major causes of landconflict in the area were failure to respect farmboundaries ($\bar{x}$=10.4), contesting theinheritance of the land ($\bar{x}$=12.9), and destruction of farm crops by grazing animal ($\bar{x}$=11.9). Other major causes with less effects are abandonment of previously accepted rules of access to and use of land ($\bar{x}$=8.7), improper sharing of joint resources ($\bar{x}$=7.8) and Illegal sale of landby family lineage or community ($\bar{x}$=8.6).The findings on failure to respect farm boundary isin agreement with (Omotara, 2016, Yamano and Deininger 2005 and Dunmoye2003) who reported that boundarydispute is a major factor of communal crisis inNigeria and in Kenya about half of land conflictsare over boundaries issues between neighbours orrelatives. The second one is contesting theinheritance of land due to its increase in value. Thisshows that land is becoming a very scarce factor ofproduction, either due to population pressure,urbanization, land alienation or concentration ofland in a few hands. Illegal sale of land by familylineage or community deprived the familymembers their rights to own lands and thisprovokes action to defend their interest (Bogale,Taeb and Endo, 2006).

Furthermore, the findings on abandonment ofpreviously accepted rules of access to and use of land is similar with Asiyanbola (2010) whoreported that the first major economic crisisbetween Ife and Modakeke was land tribute(Isakole) which Ife collected from Modakeke until late 1970's The promulgation of land use decreeof 1978 abolished land tributes while Ife saw it asinfringement of their own right, the other groupsaw the decree as an opportunity for free tenancyand refused to pay land tributes to their landlordculminating into conflicts, which degenerated intokilling, arson and mayhem of unprecedentedproportions. Zwain (2011) found out that many

African countries are experiencing violent conflictbecause of the competition for access, control anduse of land resources.

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Table 3: Distribution of respondents by causes of land conflicts in the area n =155

Causes of land Conflict	SA	A	N	DA	SDA	Mean	Remarks
Failure to respect boundary	81	29	16	14	15	10.4	Major
Challenging inheritance of Land	90	40	4	14	7	12.9	Major
Abandonment of previously accepted rules ofaccess to and use of land	38	67	15	17	18	8.7	Major/less effect
Improper sharing of joint resources	31	53	43	13	15	7.8	Major/less effect
Illegal sale of land by the family lineage or community	28	31	67	16	13	8.6	Major/less effect
Destruction of farm crops by grazing animal	14	90	15	22	14	11.9	Major

Source: Field survey, 2021

Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), Strongly Disagree (SD)

Effects of conflicts on crop output

Regression estimates of the effects of conflicts on crop output are presented in table 3. The lead equation (Linear) was chosen based on the R^2 value, t-value as well as the significant of the estimated parameter.The model had R^2 value of 0.6354. This implies that about 64% of the variation in crop output (Y) of the respondents was explained by the independent variablesincluded in the regression model. The F-statistic was also significant at the 1% level which implies that the independent variables included in the model adequately explain the variation in the dependent variable.

The regression coefficients of fertilizer is positive and statistically significant at 1%, which implies thatan increase in fertilizer have direct influence on the increase in the output of farmers. Labour was positive and statistically significant at 5% which means that there is positive relationship between output and labour. The implication of this is that the higher the number of labours and time spent on working on the farm determines the quantum of work in the farm and invariably the output of the farmers. Number of plots own by the farmers isnegative and statistical significant at 1% which implies that the more number of plots own by farmers the likelihood of more output and income from the plots. This scrambling

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and partition to own many plots of lands probably is the cause of land conflicts in the study area this finding agreed with that of (Omotara, 2016 and Victor *et al* 2020) who discovered that farmers engaged in land crisis to own many plots of lands in Southwest Nigeria and that conflicts over farmland had negative effects on the socioeconomic activities of the rural residents.

Age is negative and statistically significant at 5%, this implies that adult's practices farming and more involve in land conflicts which invariably affects their output. Conflicts is negative and statisticalsignificant at 5% implies that land conflict have negative effects on the output of farmers. An increase in the conflicts can affects crop output by 48%. This finding is in line with that of Victor *et al* (2020) who discovered that there was evidence of significant negative impact of land conflicts on crop production and farmers income.

Table 4: Regression estimate on effects of conflicts on crop output

Variables	Coeffficients	P-Values	Standard Error
Constant	-4820.845	0.012**	1898.023
Location	73.34684	0.789Ns	273.7865
Fertilizer	35.21143	0.000***	6.244569
Labour	11.72894	0.048**	5.883161
Number of plot	-770.7735	0.007***	279.4158
Age	-48.47563	0.016**	19.96414
Nature of farming	612.2725	0.284Ns	569.5744
Education	-35.95312	0.256Ns	31.49837
Soil Quality	-118.9099	0.791Ns	447.4864
Conflicts	-48.47563	0.016**	19.96414
Number of obs	155		
F (9, 145)	28.07		
Prob > F	0.0000 ***		
R-Squared	0.6354		
Adj R-Squared	0.6127		

Note: ***, ** and * imply significant at 0.01 (1%), 0.05 (5%) and 0.1 (10%) levels, Ns implies not significant. Values in parentheses are the respective p – ratios

Source: field survey, 2021.

Socio-economic effects of conflict in the study area

Reduction in output and income of crop farmers as a result of the destruction of crops during crisis is the most prevalence of the effect. Many farmers lost part or the whole of their crops. This meant reduced yield which translated into low income on the part of the

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farmers who take farming as a major occupation. This tends to negatively affect their savings, credit repayment ability, as well the food security and economic welfare of urban dwellers that depend on these farmers for food supply.

Displacement of farmers: Farmers relocate as a result of conflict. Host farmers, especially women, who remain behind stop going to the distant farms for fear of attack, such displaced farmers have become a source of liability to other farmers whom they have to beg for food for themselves and their families. This has created a vicious cycle of poverty in such communities. Loss of lives. A lot of killing and reprisal killing by the communities takes place during the conflicts. Also some of the victims (young and old) are badly injured or maimed. This has reduced some women farmers to the status of widows. All these have drastically reduced agricultural labour force in the area. In the process there are reported cases of proliferation of small arms and ammunitions since the farming communities saw each other as archenemies. This is inimical to the spirit of integration of Nigerian tribes or ethnic groups and peaceful co-existence. This finding agrees with the earlier report of the study conducted by (Nweze 2005 and Ofuoku*et al* 2009) when they reported that twenty seven 27 people lost their lives due to conflicts between nomadic herdsmen and farmers in Kogi State of Nigeria within the period of 1996 and 2002.

Table 5: Distribution of Socio-economic effects of conflict in the study area

Effects	Frequency	Percentage	Ranking
Reduction in output/income of farmers	59	38.1	1st
Displacement of farmers	31	20.0	2nd
Loss of house and Properties	22	14.2	3rd
Loss of Produce in storage	17	11.0	4th
Arms Running	14	9.0	5th
Loss of lives	12	7.7	6th

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

This study looked at the causes and effects of land conflicts on crop production, in Lapai and Lavun Local Government areas of Niger state, Nigeria. Random samplings of one hundred and fifty five (155) farmers were selected from four wards of Lapai and LavunLocal Government Areas respectively. The villages selected are Doko and Boku wards in Lavun LGA and Gbami and Edda in Lapai LGAs of Niger state.

. Data collected were analyzed using both descriptive statistics, Likert scale as well as multiple regression analysis. The study revealed (48.4%) of the respondents age was below 50 years while about 51.6% of the respondents were above 50 years. The mean age of the farmers in the study area was 50.02 while 11.02 is the deviation from the mean. The coefficient of variation (CV) is 22% indicating consistency in the percentage

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deviation from the mean. The modal age of the respondents was 51 to 60 years. This shows that majority of the youths have migrated from rural areas to urban areas as a result of land conflicts in search of greener pastures leaving older people to do farming.

The result also revealed reveals that the major causes of landconflict in the area were failure to respect farmboundaries ($\bar{x}$=10.4), contesting theinheritance of the land ($\bar{x}$=12.9), and destruction of farm crops by grazing animal ($\bar{x}$=11.9). Other major causes with less effects are abandonment of previously accepted rules of access to and use of land ($\bar{x}$=8.7), improper sharing of joint resources ($\bar{x}$=7.8) and Illegal sale of landby family lineage or community ($\bar{x}$=8.6).

The result of the regression coefficients of Conflicts is negative and statistical significant at 5% implies that land conflict have negative effects on the output of farmers. An increase in the conflicts can affects crop output by 48%.

Conclusion

The following conclusion was drawn based on the findings of the study. Inheritance system of land ownership is the major source of land for farming in the area and majority of the farmers are peasant in nature cultivating between one to three hectares of land. Major causes of conflicts over farmland in the area were failure to respect boundary, contesting the inheritance of land and abandonment of previously accepted rules of access to and use of land. Conflict over farmlands had a negative effect on the socio-economic activities of rural residents as it lead to termination of social interaction, among people mistrust among members, destruction of life and property as well as low agricultural productivity and income.

Recommendations

Based on the findings of this study, the following recommendations were made:

i. Individual and community farm boundaries should be respected to avoid court cases and litigations, which could lead to wastage of resources and loss of manpower days.

ii. There must be an effective system of land administration of management to reduce frequent challenges of land ownership. Accepted rules to access and use of land in each area must be strictly adhered to and inheritors should be loyal to the agreement made with their progenitors on the use of land.

iii. Public education/enlightenment programmes must be strengthening to reduce the adverse effect of land conflicts .Land conflicts issue should be settled amicably using indigenous conflict resolution methods before degenerating into full-blown war and loss of life.

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Assessment of the Effects of Recruitment Challenges on the Performance of Employees in Federal Inland Revenue Services (FIRS)

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Abstract

The study on assessment of the effects of recruitment challenges on the performance of employees observed that most institutions in Nigeria are bedeviled with so many recruitment challenges thus, it examined the effects of recruitment challenges on the performance of employees at the Nigeria's Federal Inland Revenue Services. This ex-post and descriptive study had a population of 2,867 employees that was reduced to a sample size of 400 determined using the Yamane formula. Subsequently, copies of questionnaire were administered on this sample size and 339 representing 84.75 percent were completed, returned and used for the analysis. The analysis was conducted using the simple percentage statistical technique while the multiple regression via the SPSS was used to test the formulated hypotheses. The study found significant but inverse relationships and effects between recruitment challenges and employees' performance. Consequently, the study recommended that serious, concerted and significant efforts should be made by the relevant authorities such as the management of the organization and other supervisory government agencies and departments to discourage political interferences and nepotism as well as to ensure strict adherence to the process and principles of federal character in order to recruit appropriate employee for improved and sustained employees' performances.

Key words: Recruitment, Challenges, Employees, Performance, Organizational Citizenship, Productivity

1.0 INTRODUCTION

Background to the study

The most essential element behind performance in every organization is human resource, because activities in an organization cannot just occur without the presence of human beings that are employees (Bature, 2013). Employees are those persons hired to provide a service to a company or organization in exchange for compensation and who does not provide these services as part of an independent business. Khan (2015) asserted that it is widely accepted that the human factor is one of the most important asset or resource of any organization, because things are getting done through them. In essence, it is human being that initiates the

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existence of any organization in line with the predetermined objectives.

The searching and attraction of the right calibre and quantity of this human factor into every organization is one very serious activity that should be devoid of all forms of sentiments and prejudices. It is an imperative exercise that can make or mar any organization. This exercise is usually an integral part of the human resource policy of all serious organizations and it could be internal or external. Whatever way or method that is chosen at any point in time is diligently thought through. It is often targeted at getting the most qualified and appropriate employees that can and should consistently perform at or above acceptable levels in terms of productivity, commitment, punctuality, organizational citizenship, etc. But as human beings that are fallible, there is rarely any exercise that is not faced with challenges. This challenges could be natural or beyond the control of human beings or they are man made. Challenges in all facet of life are inevitable; likewise recruitment practices are not exceptional. Human resource managers must ensure strict adherence to the laid down policies and strategies with regards to hiring of employees in their respective organizations.

Statement of the problem

It has been observed that most institutions in Nigeria including those in the public and private sectors are bedeviled with so many recruitment challenges. This may be more prevalent the Nigeria's public organizations such as the Federal Inland RevenueService (FIRS). These organizations are faced with such recruitment related challenges such as nepotism, political interferences and the lack of adherence to the principles of federal character. These aforementioned challenges are mostly man-made and are from influential Nigerians from the public and political sectors such as the elected members of the National Assembly, political appointees, traditional and religious leaders, influential persons in the private sectors, etc.

It is becoming a new normal that when a recruitment exercise is taking place in such organizations, these aforementioned influential put unbearable pressure on the chief executives of these organizations to employ their recommended persons thus rubbishing the integrity of the exercise and recruiting highly unqualified and inappropriate persons that may turn out poor performances in terms of productivity, commitment, punctuality, organizational citizenship, etc.

The aforementioned challenges are perceived to have affected the qualities of services rendered by most of these institutions. Most particularly, the effectiveness and efficiencies of those recruited through such processes are assumed to be negatively impacted as they are seen to owe their allegiances to the favours done them through such challenges instead of to the system.

Research Questions

Based on the statement of problem, the following research questions were drawn:

i. To what extent have the recruitment challenges in Federal

Inland Revenue Services (FIRS) affected the employees' productivity?

ii. How have the recruitment challenges in Federal Inland Revenue Services (FIRS) affected the employees' organizational citizenship?

Objectives of the study

The main objective of the study was to assess the effects of recruitment challenges on the performance of employees in the Federal Inland Revenue Services (FIRS). The specific objectives were to:

i. Ascertain the extent to which recruitment challenges in Federal Inland Revenue Services (FIRS) have affected the employees' productivity.

ii. Evaluate how the recruitment challenges in Federal Inland Revenue Services (FIRS) have affected the employees' organizational citizenship.

Statement of Hypotheses

H_{O1}: Recruitment challenges have not significantly affected the employees' productivity in Federal Inland Revenue Services (FIRS).

H_{O2}: Recruitment challenges have not significantly affected the employees' organizational citizenship in Federal Inland Revenue Services (FIRS).

2.0 LITTERATURE REVIEW AND THEORETICAL FRAMEWORK

Conceptual Framework

Concepts of Recruitment Challenges

Gamaje (2014) defined recruitment as the process of attracting and choosing candidate for employment while Bature (2013) described it as what managers do to develop a pool of qualified candidates for open positions. Ofori and Aryeetey (2011) also described recruitment as a "process of generating a pool of competent individuals to apply for employment within an organization". Opatha (2010) saw it as the process of finding and attracting suitably qualified people to apply for job vacancies in an organization.

Recruitment is a means through which potential applicants get to be aware of vacancies availability around them and develop interest to apply. However, it is a means through which organizations persuade the pool of applicant in large quantity so that they select the best among. It is also all about creating awareness through a proper communication channelto the potential employees who are willing to exchange service for reward internally or externally.

This human resource exercise of searching, creating awareness and attracting the right calibre of potential employees is bedeviled with so many challenges in recent times that significantly affect the integrity and the outcome of the whole exercise. Common amongst these challenges in developing economies like Nigeria include nepotism, political interferences and the lack of adherence to the principles of federal character that are consequences of the interference of influential Nigerians from the

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public, private and political sectors such as the elected members of the National Assembly, political appointees, traditional and religious leaders, influential persons in the private sectors, etc.

Nepotism

The word Nepotism is from the Latin word *'Nepo',* which means *nephew.* Arsim (2016) observed that it is from the Italian '*Nepote',* which means the *'son'* and that is a practice of granting special favour to grand children or employment of close relatives. Zulova (2015) described nepotism as giving priority to family members and relatives with regard to employees' selection. It can be deduced from this definition that it is a concept that revolves around recruitment and selection, but goes beyond that to include other human resource ,management practices such as promotion, job enlargement and job enrichment.

Nepotism replaces the principle of merits such as skills, knowledge, experience, ability, and competency during recruitment and other human resource management practices. Onoshihenko and Williams, (2014) revealed that Ukraine, studies have shown that school leavers by pass formal procedures to take employment through social connection. They also disclosed that in Denmark, research has also shown that 6% of present employees were employed by the same employer that had employed their parents as well.

Nepotism is a global phenomenon that occurs in developed and developing nations as well as public, private, profit and non- profit organizations. However Al- Shawawreh, (2016) argued that it is practiced more in private organization especially family business where they believe with family continuity in the business.

Political Interference

Political interference can be seen as a different form of nepotism with relation to recruitment, while nepotism is giving preferential treatment to family, relatives and tribal persons, political interference is going a step further by kind of compensating political allies, political thugs and other party loyalist in form of political patronage. Many researchers argued that one of the factors that have ruined and contributed to the decay in public sector performance is the interferences or influences of politicians in the recruitment process. Yaro (2014) observed that, political interferences in recruitment have relegated merit and increased cases of incompetence. Agbo (2010) attested that political interference is father of recruitment challenges because it has led to favoritism, unmerited promotion, appointment of unqualified Directors General and their subordinates in accordance with the whims and caprices of these politicians.

Non-Adherence to the Principles of Federal Character

Many researchers viewed federal character principle as a problem with regard to employment of incompetent employees. Federal character has its own peculiar shot comings, but adherence to it cannot be seen

as a problem, rather non-adherence to its procedure as enshrined in the federal character principle is the source of recruiting unqualified candidates in the Nigerian public service.

Yaro (2014) observed that the principle of Federal Character has compounded the recruitment problem as it has legalized nepotism and segregation in the exercise in the form of ethnic balancing. Olusoji, Oluwakemi and Mofope (2014) captured that the principles of federal character created more problems than it attempted to solve by glorifying mediocrity over meritocracy. Tukur (2015) opined that the problem of the principle of federal character is deviation from the formula because jobs and appointments are directed toward patronage, connection and bootlicking. He added that the principle is not the problem but the violation of its procedure.

Employees' Performance

The Cambridge Dictionary described performance generally as how well a person or a machine or any other variable does a piece of work or an activity while Mubbsher (2013) specifically defined employees' performance as employees' productivity and efficiency. Dhammika (2013) described employee performance as the amount of output generated from job execution by an employee over a particular period of time in an organization. But Filtin and Alwis (2014) stated that employees' performance constitutes behavior and outcome, but most often it is the outcome that is being measured. Prasetya and Kato (2011) described employees' performance as the attained outcome of action with the skill of these employees that perform in some situation.

Igbokwe, Chinyeaka and Agbo, (2015) opined that performance is generally and simply the extent to which an individual, a unit or a department carry out task assigned to him or it. It is also a means by which an organization evaluates an employee's input and output level especially in the area of attaining set goals or how well a particular task is accomplished. According to Office of Financial Management, (OFM; 2009) performance measurement is numeric description of an agency's work and the result of the work.

Performance is measured using different variables that are either quantitative or qualitative. It is mostly seen as a quantifiable expression of the amount, cost, or result of activities that indicates how much, how well and at what level product or service is provided during a given time period. The measurement variables are mostly dependent on the nature of the organization and the nature of the tasks or assigned roles to the employees. For the purpose of this study and the organization, employees' performance was measured using employees' productivity and organizational citizenship.

Employee Productivity

Hanaysha, (2016) submitted that employee productivity is one of the emerging concepts in management literature and it is one of the foremost challenges confronting organizations. Kawara (2014) observed that the increasing interest in this concept might

be related to the fact that, organizational success significantly relies on the productivity level of its workforce. However, productivity itself is of immense concern for almost all organizations and managers, therefore, must be taken seriously.

Sultana, Irum, Ahmed and Mehmood (2012) defined employee productivity as the time spent by an employee in executing his or her job duties in order to achieve expected outcomes based on the job description. Massoudi and Hamdi, (2017) described employee productivity as an assessment of the efficiency of a worker or group of workers while Kaimahi (2015) explained the concept of productivity as the employee's ability to produce work or goods and services according to the expected standards set by the employers, or beyond the expected standards. Okereke and Daniel (2012) concluded that employee productivity can be determined by comparing the total output to the total input used by the employee.

The concept of productivity is one that has been used interchangeably with the concept of output. Productivity is the ratio of output or production capacity of the workers in an organization. The ultimate essence of motivating employees is to meliorate productivity.

Organizational Citizenship

Tian, Iqbal, Akhtar, Qalati, Anwar, and Khan (2020) disclosed that the concept of organizational citizenship was first introduced in the early 1980s and was then described as the specified behaviours of employees within an organization. Tambe (2014) defined it as the voluntary employees' behaviours to prove themselves as good citizens of the organization. Tian, et al (2020) described organizational citizenship as the behaviours that employees of an organization or organizations display outside their formal responsibilities. It is the discretionary behaviour that is not explicitly or directly recognized by the organization's formal reward system. Summarily, it refers to the extent or degree to which employees freely or voluntarily contribute to the success of the organization. It can be referred to as the extent of passion employees possess.

Theoretical Framework and Base

This study was hinged on two goals theories including the Goal-Setting Theory of Motivation developed by Edwin Locke in the 1960's and Robert House's Goal Theory propounded in 1971. These theories were adopted because the essence of every recruitment exercise is to enable the organization and the employees attain their set goals. Edwin Locke in his proposal submitted that organizational or individual goal setting is linked to task performance. Thus, the organization embarks on recruitment to attract the most appropriate persons that can help attain it set goals. Consequently, the alteration of such process is likely to have dire consequences.

Robert House'sGoal theory is ageneral approach to motivation that emphasizes the need to establish goals for intrinsic motivation. It observed that there is nexus amongst goals attainments, efforts and performances. This nexus remains if the

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recruitment employee is commitment (in this case by way of productivity and organizational citizenship) to attaining the goal. Furthermore, the employees most possess the ability (requisite skill, knowledge, qualification and competence, not connection or nepotism) to attain such goals.

Review of Empirical Studies

Mokaya, MukhwesoandNjuguna (2013) conducted a related study and examined the effects of recruitment practices on employee performance in the cooperative sector of Kenya focusing Kenya Union of Savings and Credit Cooperatives (KUSCCO) Limited. The study administered copies of questionnaire on a sample size of 89 selected from amongst 177 employees using the stratified sampling technique. The gathered data was analyzed using the simple percentage, frequencies, mean and standard deviation while the correlation and regression techniques were adopted to determine and explain relationships. The study found that all the adopted sub scales of the recruitment including sources, policies and messages had weak but positive relationship with the employee performances. Specifically, the study found that recruitment sources contributed more to the employee performance.

Rozario, Venkatraman and Abbas (2019) studied the challenges in recruitment and selection processfocusing on tertiary and dual education sectors in urban and regional areas of Australia. The study concentrated on identifying the critical aspects of the process that can influence the decision based on different views of the participants such as, hiring successful and unsuccessful applicants. Various factors including feedback provision, interview panel participation as well as preparations, relevance of interview questions, duration and prejudices were analyzed and their correlations were studied to gain insights in providing suitable recommendations for enhancing the process.

In another related study by Pshdar, Baban, Bayar, Sarhang, Hassan, Shahla, Bawan,Nechirwan, Bayad and Govand (2021) who administered copies of questionnaire at Telecommunication Companies in Erbil-Kurdistan with the aim of determining the recruitment and selection procedures in organizations, and finding out the methodologies that are involved in the process. The gathered data from the 69 respondents was analyzed using SPSS(version 23). The results showed that there was no difference in applicants' race and gender in internal promotion.

Ofobruku and Iheabunike (2013) assessed recruitment practice and organisation performance in selected hospitality businesses in Abuja, Nigeria having observed that the current inability of hospitality businesses to attract and employ the most suitable employee with the right knowledge skills and attitude has resulted in high employees' turnover. Responses were analyzed using weighted mean and the study recommended that related organizations must always strive attract and retain the best hands at all times.

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In a related study Tabiu and Nura(2013) examined the effects of HRM on employees' performance at Usmanu Danfodiyo University, Sokoto and found that some HRM practices correlate significantly with employees' performance even though all are related. It was however suggested that constant review of the HRM practices for organizations to move with time should be employed.

3.0 METHODOLOGY

The study adopted ex-post facto and descriptive survey design in order to diligently assess and explain the effects of recruitment challenges on the performances of employees at the Federal Inland Revenue Services (FIRS).The study had a population of 2867 employees cutting across different cadres, strata, units, and departments. This population size was reduced to a sample size of 400 using the Yamane formula. Subsequently, copies of questionnaire were administered on the determined sample using the purposive (preference to employees in the HRD) and simple random techniques. Collated data was analyzed using simple percentage while the multiple regression via SPSS was used to test the formulated hypotheses.

This regression models for the selected employees of FIRS HQ were stated as follows:

$E_{Pro}=\infty + \beta_1 (N_P) + \beta_2 (P_I) + \beta_3 (N_F) + \varepsilon_i 1$

$E_{OC}=\infty + \beta_1 (N_P) + \beta_2 (P_I) + \beta_3 (N_F) + \varepsilon_i 1$

Table 4.1 Model Summary

***(Source:** The researcher, 2021)*

Where:

E_{PRO} = Employees' Productivity

E_{OC} = Employees' Organizational Citizenship

∞ is the intercept/slope

β_1, β_2, and β_3 were the regression coefficient or slopes that indicated the extent of effects of each sub scale or construct of the independent variable (recruitment challenges). The independent variable was measured by such sub scales as Nepotism (N_P); Political Interference (P_I); and Non adherence to principles of Federal Character (N_F)

$\varepsilon_i 1$ is the stochastic error term.

4.0 DATA PRESENTATION AND ANALYSIS

This section covered the presentation and the analysis of the data gathered from the opinions of the 339 respondents because, out of the 400 copies of administered questionnaire only 339 copies representing 84.75 response rate. The gathered data was analyzed using SPSS version 25.00 statistical software package.

Test of Hypotheses

Hypothesis One

H_{O1}: Recruitment challenges have not significantly affected the employees' productivity in Federal Inland Revenue Services (FIRS).

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Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.975[a]	.950	.949	.33128

a. Predictors: (Constant), NF, PI, N

Table 4.1 is the model summary table the revealed the extent of the collective effects of all the sub scales of the recruitment challenges including Nepotism (NP); Political Interference (PI); and Non adherence to principles of Federal Character (NF) on the selected employees' productivity at the organization. The table revealed that the three subscales were collectively responsible for 95% change in the employees' productivities while the outstanding 5% were by other factors not captured in this study.

Table 4.2 ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	694.056	3	231.352	2108.103	.000[b]
	Residual	36.764	335	.110		
	Total	730.820	338			

a. Dependent Variable: Pro

b. Predictors: (Constant), NF, PI, N

The ANOVA table 4.2 revealed the level of significance (differences in opinions of the different cadres of respondents). Given a level of significance of 5% and an F-statistics value of 2108.103, which is above the level of significance; the table indicated non significance differences in the opinions of the respondents. That showed that there are no significant differences in the opinions of the

different cadre, department and units of the respondents.

Furthermore, with an F-statistics value above the mean square value, the null hypothesis one **(H_{01})** is rejected.

Table 4.3 Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.224	.050		4.520	.000
	N	-.617	.056	.577	-11.058	.000
	PI	-.321	.046	.324	-6.910	.000
	NF	-.082	.043	.084	-1.931	.054

a. Dependent Variable: Pro

$E_{Pro}=\infty + \beta_1 (N_P) + \beta_2 (P_I) + \beta_3 (N_F) + \varepsilon_1$

$E_{Pro}=.224-.617(N_P)-.321(P_I)-.082(N_F)$

Table 4.3 is the coefficient table that disclosed the extent of effects of each sub scale of the independent variable, recruitment challenges including Nepotism (N_P); Political Interference (P_I); and Non adherence to principles of Federal Character (N_F) on the selected employees' productivity at the organization. These coefficients were further captured in the mathematical function $E_{Pro}=.224-.617(N_P)-.321(P_I)-.082(N_F)$.

The function indicated that for every 1 per cent change in the selected employees' productivity (E_{Pro}), there were 61.7% inverse change in Nepotism (N_P); 32.1% inverse change in Political Interference (P_I); and 8.2% inverse change in Non adherence to principles of Federal Character (N_F). There were inverse changes because the coefficients were negative, which meant reduction in such practices. Thus, it can be deduced from the table and the function that less change in Non adherence to principles of Federal Character (N_F) brought about more effects on the selected employees' productivity (E_{Pro}) while more changes in Nepotism (N_P) brought about the same level of changes in the selected employees' productivity (E_{Pro}). So, Non adherence to principles of Federal Character (N_F) had the

most effects on the selected employees' productivity (E_{Pro}) while Nepotism (N_P) had the least effects.

Hypothesis Two

H_{O2}: Recruitment challenges have not significantly affected the employees' organizational citizenship in Federal Inland Revenue Services (FIRS).

Table 4.4 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.971[a]	.942	.941	.31423

a. Predictors: (Constant), NF, PI, N

Table 4.4 is the model summary table the revealed the extent of the collective effects of all the sub scales of the recruitment challenges including Nepotism (N_P); Political Interference (P_I); and Non adherence to principles of Federal Character (N_F) on the selected employees' organizational citizenship at the organization. The table revealed that the three subscales were collectively responsible for 97.1% change in the employees' organizational citizenship while the outstanding 5% were by other factors not captured in this study.

Table 4.5 ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	537.229	3	179.076	1813.630	.000[b]
	Residual	33.078	335	.099		
	Total	570.307	338			

a. Dependent Variable: OC

b. Predictors: (Constant), NF, PI, N

The ANOVA table 4.5 revealed the level of significance (differences in opinions of the different cadres of respondents). Given a level of significance of 5% and an F-statistics value of 1813.63, which is above the level of significance; the table indicated non significance differences in the opinions of the respondents. That showed that there are no significant differences in the opinions of the different cadre, department and units of the respondents.

Furthermore, with an F-statistics value above the mean square value, the null hypothesis two**(H_{02})** is rejected.

Table 4.6 Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.493	.047		10.463	.000
	N	-.490	.053	.518	-9.249	.000
	PI	-.230	.044	.262	-5.210	.000
	NF	-.175	.040	.203	-4.328	.000

a. Dependent Variable: OC

$E_{OC}=\infty + \beta_1 (N_P) + \beta_2 (P_I) + \beta_3 (N_F) + \varepsilon_1$

$E_{OC}=.493-.49(N_P)-.23(P_I)-.175(N_F)$

Table 4.6 is the coefficient table that disclosed the extent of effects of each sub scale of the independent variable, recruitment challenges including Nepotism (N_P); Political Interference (P_I); and Non adherence to principles of Federal Character (N_F) on the selected employees' organizational citizenship (E_{OC}) at the organization. These coefficients were further captured in the mathematical function $E_{OC}=.493-.49(N_P)-.23(P_I)-.175(N_F)$

The function indicated that for every 1 per cent change in the selected organizational citizenship (E_{OC}), there were 49% inverse change in Nepotism (N_P); 23% inverse change in Political Interference (P_I); and 17.5% inverse change in Non adherence to principles of Federal Character (N_F). There

were inverse changes because the coefficients were negative, which meant reduction in such practices (challenges). Thus, it can be deduced from the table and the function that less change in Non adherence to principles of Federal Character (N_F) brought about more effects on the selected organizational citizenship (E_{OC}) while more changes in Nepotism (N_P) brought about the same level of changes in the selected organizational citizenship (E_{OC}). So, Non adherence to principles of Federal Character (N_F) had the most effects on the selected organizational citizenship (E_{OC}) while Nepotism (N_P) had the least effects.

Discussion of Findings

The computed results of the studybased on the opinions of the respondents revealed significant but inverse relationship and effects between the independent variable, recruitment challenges and the dependent variable, employees' performance. The results indicated inverse changes because the computed coefficients were all negative, which simply meant reduction or increase in the recruitment challenges had resulted in increase or decrease in the selected employees' performances respectively.

Specifically and with respected to the adopted sub scales or measurement variables, it can be deduced from the tables and the functions that less change in Non adherence to principles of Federal Character (N_F) brought about more effects on the selected employees' productivity (E_{Pro}) and organizational citizenship (E_{OC}) while more changes in Nepotism (N_P) brought about the same level of changes in the selected employees' productivity (E_{Pro}) and organizational citizenship (E_{OC}). So, Non adherence to principles of Federal Character (N_F) had the most effects on the selected employees' productivity (E_{Pro}) and organizational citizenship (E_{OC}) while Nepotism (N_P) had the least effects.

Thus, overall, recruitment challenges have significantly affected the selected employees' productivity (E_{Pro}) and organizational citizenship (E_{OC}) at Federal Inland RevenueServices (FIRS).

Conclusions and Recommendations

The study found significant but inverse relationship and effects between recruitment challenges and employees' performance. The results indicated inverse changes because the computed coefficients were all negative, which simply meant reduction or increase in the recruitment challenges had resulted in increase or decrease in the selected employees' performances respectively.

Consequently, the study recommended that serious, concerted and significant efforts should be made by the relevant authorities such as the management of the organization and other supervisory government agencies and departments to discourage political interferences and nepotism as well as to ensure strict adherence to the process and principles of federal character in order to recruit appropriate employee for improved and sustained employees' performances.

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Oil Price Volatilityand International Trade in Nigeria

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Abstract

Trade is a crucial engine of economic growth particularly in a fast growing economy like Nigeria. Considering the importance of oil as an internationally traded commodity, its volatility could result to external trade imbalances especially in oil exporting economies like Nigeria. As such, this study examines the effect of oil price shocks on international trade via Oil Trade Balance (OTB), Non-Oil Trade Balance (NOTB) and Terms of Trade (TOT). Crude Oil Price Volatility (COPVOL) was measured and extracted using ARCH/GARCH model with data spanning from 1990-2019. The paper conducted the stationarity and cointegration test to examine the time series characteristics of the variables, and applied the Structural Vector Auto Regressive (SVAR) Model as well as Impulse Response Function (IRF) and Forecast Variance Decomposition (FVD) to examine the influence of oil price shocks on Oil Trade Balance (OTB), Non-Oil Trade Balance (NOTB) and Terms of Trade (TOT). The result showed that upward swings in oil price have a positive and significant impact on Terms of Trade and Oil Trade Balance, however, for Non-Oil Trade Balance, Oil price Shocks is negative and insignificant. The paper, therefore, recommended that Government should exploitthe downstream sector of the oil industry to capture additional values from hydrocarbons resources, linking new petrochemical facilities with refineries to capture operational synergies; and to strengthen entrepreneurship through access to finance to encourage innovation and technology towards transforming the economy. The paper further recommended improving quality and standard of exports to encourage demands towards improving Nigeria's terms of trade.

Key Words*:* Oil price shock, International Trade, Terms of trade,

1.0 INTRODUCTION

The provision of plausible explanation for the relationship between oil price volatility and macroeconomic variables has occupied the attention of researchers and policymakers over the last four decades; especially the central roleoil plays in the world economy and the observed link between oil price movement and business cycle. Many studies exist in Nigeria where proceeds from crude oil sales accounts for major proportion of government total earnings with attendant implications for the larger economy.

Oil has been a dominant factor in Nigeria's fiscal space since the 1970s. The various episodes of oil price boom since the late 1970s resulted in substantial revenue accretion, which gave the government the

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much-neededimpetus to embark on additional expenditure outlays to promote economic growth. Thus, the sizeable oil-windfall over the years has made the country oil dependent and extremely vulnerable to the volatility in international oil prices. A study by the World Bank (2013) found the Nigerian economy among the most volatile in the world between 1961 and 2000. The study attributed this finding mainly to oil price volatility.

Trade is a crucial engine of economic growth particularly in a fast growing economy such as Nigeria, while oil is one of the highly traded commodities in the world. Given the importance of oil as an internationally traded commodity, its volatility could result to external trade imbalances especially in oil exporting economies like Nigeria. As such, this study examines the effect of oil price shocks on international trade via trade openness and trade balance.

A large literature has investigated the macroeconomic impact of oil-price shocks, focusing in particular on the response of real economic growth and consumer price inflation in oil-exporting countries (Barsky and Kilian, 2004 and Hamilton, 2005). A much smaller literature including, for example, Bruno and Sachs (1982), Ostry and Reinhart (1992), and Gavin (1990, 1992) has studied the impact of oil price shocks on external accounts. This relative neglect of the external channels of the transmission of oil price shocks does not reflect a lack of interest in this question.

Other studies such as Tiwari and Olayeni (2013) and Lilian (2009) have focus on oil importing countries like India and Japan, however this study deviate by focusing on Nigeria, an oil exporting developing country. Though Babatunde (2018) study was on Nigeria, the study did not consider terms of trade (TOT). One channel through which oil price affects an economy is through the terms of trade. A rise in oil prices is likely to improve the terms of trade for oil exporters, but worsen the terms of trade for importers. This tends to raise the demand for non-oil goods and services in oil-exporting economies, but reduce demand in oil-importing economies.

Thus, price volatility becomes of great concerns to every country that deals in oil in commercial quantity. This is more so because it determines the direction of government revenue and hence macroeconomic variable (including external balance) anywhere. The assertion that volatility only affects oil-exporting nation may not be true. The fact is that both importing nations and exporting nations have their fair share of effects from continuous volatility. Specifically, exporting nations gain when international price of petrol becomes very high while the importing nations record losses. The reverse would be the case if the international price of petrol should fall deep low. This study becomes interesting, as Nigeria is both oil exporting and oil products importing country, the study fill the gap in literature byincluding terms of trade to examinethe effect of oil price volatility innNigeria.In terms of methodology this study is also an

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improvement on previous studies carried out on Nigeria as it uses quarterly data from 1990-2019 analysed with the system equation of three stage least square technique. Thus, the study intends to provides answers to the research question: whether there exist volatility in oil price and if yes, to what extent does it affect trade balance in Nigeria?

Furthermore, the study decomposes the aggregate trade balance into oil and non-oil trade balance. This is necessary for policy makers, especially in oil dependent economies, to understand the dynamics of oil price shocks on the macro economy.

2.0 Literature Review and Theoretical Framework

Over the past twenty years, dozens of scholars have explored the relationships between oil volatility and macroeconomic performance of different economies. Different methods of analysis have yielded different results. Review some of these studies relating to oil price shocks are made in this section starting with studies on the Nigerian economy.

Aliyu (2019) assesses empirically, the effects of oil price shocks on real macroeconomic activity in Nigeria. The variables used were, oil price volatility, GDP and exchange rate. The methodology used includes Granger causality tests and multivariate Vector Auto-Regression (VAR) analysis using both linear and non-linear specifications. The study finds evidence of both linear and non-linear impact of oil price shocks on real GDP. In particular, asymmetric oil price increases in the nonlinear models are found to have positive impact on real GDP growth of a larger magnitude than asymmetric oil price decreases.

Husain, (2018) assess the impact of oil price shocks on non-oil economic cycle in 10 oil rich countries, including Oman over the period 1990-2007. The results obtained using panel VAR on the behaviour of government expenditure during boom/bust on commodity price cycles of 32 oil rich countries over the period 1992-2009, show that in countries where the oil sector is dominant, oil price changes affect the economic cycles through the fiscal policy channel.

Oriakhi & Osaze (2013),in an attempt to also establish the impact of oil price volatility on the Nigerian macroeconomic variables, examined the effect of oil price volatility on the growth of the Nigerian economy using quarterly data from the period 1970 to 2010; the study employed the VAR methodology. The study found that oil price volatility had a direct impact real government expenditure, real exchange rate and real import, while the impact on real GDP, real money supply and inflation was through other economic variables particularly, real government expenditure. This implies that oil price volatility determines the level of government expenditure, which successfully determines economic growth in Nigeria.

A similar study by Olomola (2016) investigated the impact of oil price shocks on aggregate economic activity (output, inflation, the real exchange rate and money supply) in Nigeria using quarterly data from 1970 to 2013. The findings revealed that

contrary to previous empirical findings, oil price shocks do not affect output and inflation in Nigeria significantly. However, oil price shocks do significantly influence the real exchange rate. The study argued that oil price shocks may give rise to wealth effect that appreciates the real exchange rate and may squeeze the tradable sector, giving rise to the "Dutch-Disease".

Umar &Kilishi (2010) examined the impact of crude oil price changes on four key macroeconomic variables in Nigeria (GDP, money supply, consumer price index and unemployment). They used annual data from 1970 to 1980 and employed the VAR methodology. They found that crude oil prices have significant influence on GDP, money supply and unemployment. However, its impact on consumer price index was insignificant. They are of the conclusion that oil price volatility affects the GDP, money supply and unemployment in Nigeria.

Apere and Ijomah (2013) investigated the relationship between oil price volatility and the Nigerian macroeconomic variables. The study used the exponential generalized autoregressive conditional heteskedasticity (EGARCH) and impulse response function and lag-augmented VAR (LA-VAR) models in its analysis. The study found a unidirectional relationship between interest rates, exchange rate and oil prices but no significant relationship between real GDP and oil prices. The paper concluded that fluctuations in oil prices do substantially affect the real exchange rates and interest rate in Nigeria. However, the study found that it is not the oil price itself but rather its manifestation in real exchange rates and interest that affects the fluctuations of aggregate economic activity (GDP).

Oyeyemi (2013) using annual data for the period 1979-2010 investigated the impact of oil price volatility on Nigeria's macroeconomic stability using robust least squares method. The study found that there is a positive relationship between oil price and the real exchange rate, which implied that an increase in oil price leads to an appreciation of the real exchange rate and increases the output level. Specifically, the estimates revealed that a unit change in crude oil price level would cause real GDP to change by 15.0 per cent. He also observed that accumulation of foreign exchange and increase in government capital and recurrent expenditure was because of periods of oil boom in Nigeria while its decrease had a destabilizing effect on the balance of payment position and government finances.

According to Ani et al. (2014), oil price volatility does not have significant impact on the Gross Domestic Product (GDP) and exchange rate in Nigeria, at least not in the short run; a positive but insignificant relationship exists between oil price and Nigerian GDP. The study is of the conclusion that countries amply endowed with resources, tend to grow slower than others are as is the case in Nigeria. This study uses annual data spanning 1980 to 2010, and applied the causality and ordinary lease squares analytical techniques. The result suggests that Nigeria has a special case of the

Dutch disease, where a country seemingly good fortune proves ultimately detrimental to its economy.

According to Alhassan and Abdulhakeem (2016) analyzed Oil Price- Macroeconomic Volatility in Nigeria, adopting a GARCH model and its variants (GARCH-M, EGARCH and TGARCH) on daily, monthly and quarterly series found that all the macroeconomic variables considered in the study (real gross domestic product, interest rate, exchange rate and oil price) were highly volatile. It was revealed that the asymmetric models (TGARCH and EGARCH) out-perform the symmetric models (GARCH (1 1) and GARCH – M), and oil price is a major source of macroeconomic volatility in Nigeria. What this means is that, the Nigerian economy is not just vulnerable to external shocks (exchange rate volatility and oil price volatility) but also the internal (interest rate volatility, real GDP volatility). Thus, the conclusion that asymmetric models should be given more credence in dealing with macroeconomic volatility in Nigeria and oil price volatility should be considered as relevant variable in the analysis of macroeconomic fluctuations in Nigeria.

Alley et al. (2014) examined the relationship between oil price shocks and Nigerian economic growth covering the period 1981 to 2012 using general methods of moment (GMM) model, the study established that oil price shocks negatively (though not significant) impact on economic growth but that oil price itself have a positive and significantly impact on it. The study recommended that the Nigerian economy should diversify her export revenue base in order to minimize the dependence on crude oil and petroleum products.

On studies conducted for other countries, Bartleet and Gounder (2010) examined oil price shocks and economic growth in Venezuela using the Vector Autoregressive (VAR) methodology based on quarterly data. Following the various theoretical implications that oil price shocks have on economic growth three oil price measures were considered,. The authors analyzed the short-run impact of oil price shocks in a multivariate framework, which traced the direct economic impact of oil price shocks on economic growth as well as indirect linkages. Furthermore, the models employed the linear oil price and two leading nonlinear oil price transformations to examine various short-run impacts. A Wald and Likelihood Ratio tests of Granger Causality was utilized and the results indicated that linear price change, the asymmetric price increase and the net oil price variables were significant for the system as a whole, whereas the asymmetric price variables was not. Following the causality analysis of oil price nexus, the generalized impulse responses and error variance decompositions, the study reaffirmed the direct link between the net oil price shock and growth as well as the indirect linkages.

Raguindin and Reyes (2014) examined the effects of oil price shocks on the Philippine economy over the period 1981 to 2012. Their impulse response functions for the symmetric transformation of oil prices showed that an

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oil price shock leads to a prolonged reduction in the real GDP of the Philippines. Conversely, in their asymmetric VAR model, oil price decreases play a greater role in each variable's fluctuations than oil price increases.

The empirical literature so far review affirmed that Oil price volatility hasa significant impact on the macroeconomic variables like GDP, Oil revenue and Exchange rate. However, since one of the ways oil price volatility affects an economy is through the terms of trade; this study expand on the existing studies by considering the impact of oil price volatility on Nigeria terms of trade.

2.1 Theoretical Framework

The theoretical framework for this study is the linear/asymmetric growth theory. The Linear/Asymmetric theory of growth which has as its proponents, Hamilton (1983), Gisser (1985), Goodwin (1985), Hooker (1986) and Laser (1987) postulated that volatility in GNP growth is driven by oil price volatility. They hinged their theory on the happenings in the oil market between 1948 and 1972 and its impact on the economies of oil-exporting and importing countries respectively.

According to the theory, oil price shocks affect Trade balance through the traditional channels of external adjustment labeled the "trade" (or macroeconomic) channel, and the "financial" (or valuation) channel of adjustment (Zied et al, 2016). The trade channel works through changes in the quantities and prices of goods exported and imported; while the financial channel works through changes in external portfolio positions and asset prices. Focusing first on the trade channel, an oil-price increase, *citeris paribus*, lowers real income in oil importing economies, as the terms of trade deteriorate. As real income falls in oil importing countries, firms and households will curtail their expenditures and investment plans. Oil importers' currencies will depreciate, while oil exporters' currencies will appreciate in response to their real income gains. Real output falls at least temporarily in the oil-importing economy. Over time, the initial oil trade deficit will decrease, and the non-oil trade balance increase in oil importing countries. Policy responses may further cushion or amplify these effects. For the oil exporting countries, a rise in oil price will increase foreign reserves and revenue, which will result in excessive importations if the increase in revenue is not reinvested in sovereign wealth funds, leading to BOP deficit (Woodford, 1996). The workings of the financial channel in response to an oil-price increase are more nuanced (El Anshasy & Bradley, 2012). The financial channel could either cushion or exacerbate the effect of oil price increases on oil-importing countries' external balances. A decrease in asset prices and dividends in oil-importing countries in response to an oil price increase will affect all asset owners, including residents of oil exporting countries. Conversely, asset prices in oil exporting countries will increase, again affecting all asset owners, including residents of oil importing countries. As a result, capital gains and income flows may blunt the impact of

oil-price changes on the current account. Bond and equity prices and exchange rates typically respond much faster than the prices and quantities of goods and faster than portfolio positions (Zied et al, 2016). In practice, the response will depend on the precise configuration of countries' portfolios, and the extent to which these portfolios canrebalance effectively. With certain portfolio configurations, the financial consequences of the shock could even completely offset the need for short-term external adjustment.

3.0 Methodology

3.1 Model Specification

i. Measuring Oil Price Volatility

Volatility measures the rate and magnitude of price changes around a trend. In other words, it captures the deviation of the actual observed price from its normal or expected value (Pindyck, 2002). It is important to state here that one expects crude-oil price to exhibit volatility properties *a-priori*. This is because volatility is associated with rational expectations of variables that are susceptible to daily spikes dictated by market fundamentals.

The ARCH test is used to test for conditional heteroskedasticity (existence of volatility) as suggested by Engle (1982) and applied in Narayan and Narayan (2007). The study carried out the test in order to ascertain whether an ARCH/GARCH effect exists in oil price series.

The ARCH type model, for testing the existence of volatility follows the framework of a moving average (MA). More specifically, equation (3.2) regress the square of the contemporaneous residual on the squares of their lagged residuals.

Algebraically, we specified the ARCH-type model as follows:

$$\varepsilon t^2 = \lambda + \sum_{i=1}^{p} \delta 1 x^k a^{n-k} \qquad (3.1)$$

and in a more explicit form, we have:

$$\varphi^2{}_t = \eta_0 + \eta_1 \varphi^2{}_{t-1} + \eta_2 \varphi^2{}_{t-2} + \eta_3 \varphi^2{}_{t-3} + \ldots + \eta_n \varphi^2{}_{t-n} + \iota_t$$

…….(3.2)

The study modeled the extent of volatility by formulating a GARCH (k, p) model. This becomes necessary only if the outcome of the ARCH-effect test on Crude-oil price (COP) shows that it is volatile.

The model for measuring the extent of volatility is a system model that combines both the mean equation and the variance equation. The ARCH/GARCH(q,p) model is given as;

$$h_t = \alpha_0 + \sum_{i=1}^{q} \alpha_i \epsilon_{t-1}^2 + \sum_{j=1}^{p} \beta_i h_{t-j} + V_t \qquad (3.3)$$

$$V_t \sim IIN(O, h_t) \qquad (3.4)$$

Where; $\alpha_0$is the constant term, $\epsilon_{t-1}^2$is the ARCH process, h_{t-j} is the GARCH term. To ensure the conditional variance is positive, we imposed inequality restriction on the variance equation in (3.3):

$$\alpha_0 > 0 \; and \; \alpha_i \geq 0, \beta_i \geq 0, \forall i, \text{j}$$

To ensure that the process is stationary, it is also required that:

$$\sum_{i=1}^{q} \alpha_i < 1 \quad (3.5)$$

The right hand side of equation (3.3) contains two components, the expected volatility and a random component, V_t. We further divided the expected volatility of $h_t$in (3.3) into two components, the time varying component in the summed lagged terms and the mean variance, α_o, to which the time varying component reverts, that is, $h_t$is a stationary process. We obtained the parameters α_i, β_i in equation (3.3) through the maximization of the log likelihood function:

$$\boldsymbol{l}\text{ogL} = \sum_{t=1}^{T} l_t = -\frac{T}{2}\log[2\pi] - \frac{1}{2}\sum_{t=1}^{T}\log\sigma_t^2 - \frac{1}{2}\sum_{t=1}^{T}\frac{\mu_t^2}{\sigma_t^2} \quad (3.6)$$

Where T is the sample size, and

$$l_t = -\frac{1}{2}\log[2\pi] - \frac{1}{2}\log[\sigma_t^2] - \frac{1}{2}[V_t]/\sigma_t^2 \quad (3.7)$$

Where;

$$V_t = h_t - (\alpha_0 + \sum_{i=1}^{q}\alpha_i\epsilon_{t-1}^2 + \sum_{j=1}^{p}\beta_i h_{t-j}) \quad 3.8)$$

We maximized equation 3.6 to obtain the ARCH/GARCH Parameters α_i, β_i

ii. Structural Equation Modeling

The study employed the Structural equation models to examine the influence of oil price shocks on international trade. The model used is adapted from Babatude (2018). The equations of the model are stated as:

$$NOTB = \alpha_1 + \alpha_2 COPVOL + u_1 \quad (3.9)$$

$$OTB = \beta_1 + \beta_2 COPVOL + u_2 \quad (3.10)$$

$$TOT = \gamma_1 + \gamma_2 COPVOL + u_3 \quad (3.11)$$

Where TOT is Terms of trade, OTB is Oil Trade Balance, NOTB is Non-Oil Trade Balance, and COPVOL is Crude Oil Price Volatility.

Equation 3.9; 3.10 and 3.11 will be estimated with the Three Stages Least Square (3SLS). According to Bowerman and O'connel (1979) the 3SLS is more robust to the 2SLS for system equation estimation.

3.3 Data

The study used secondary data, which were time series in nature computed quarterly. Using GARCH model on the Bonny Light oil Price, we derived the oil price shocks. The difference between oil exports and oil imports gave the oil trade balance (OB). Non-oil merchandise trade balance (NOB) is measured as the difference between non-oil exports and non-oil imports. The sample period runs from 1990 to 2019. The scope of our study was due to data availability. We sourced the data on Nigerian Bonny Light Spot Price (Dollars per barrel) from the United States Energy Information Administration (EIA, 2019); and Data on Terms of Trade, Oil Trade Balance and Non-Oil Trade Balance from The Nigerian Trade Statistics of the World Bank (2019).

4.0 Data Analysis

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The data were analyzed with Econometric views (E-views, version 9.0) using various econometric techniques to determine the direction of interaction amongst the variables under consideration. We used graphics to analyze trend in the variables under consideration; and diagnostic tests conducted to ensure the data were valid enough for relevant inferences.

4.2 Data Analysis

Table 1: Descriptive Statistics

Statistic	COP	NOTB	OTB	TOT
Mean	49.20800	-3340.641	5169.891	74.84000
Median	42.00815	-1702.861	5094.005	85.62007
Maximum	115.8579	-26.96248	13902.13	141.9712
Minimum	11.93886	-14946.82	70.67832	1.248725
Std. Dev.	32.31572	3454.347	4543.698	40.32413
Skewness	0.674402	-1.122150	0.386963	-0.594809
Kurtosis	2.154324	3.784807	1.703866	2.280652
Jarque-Bera	2.617220	4.216401	1.391462	3.663262
Probability	0.177201	0.104931	0.123355	0.087974
Sum	5904.960	-400876.9	620387.0	8980.800
Sum Sq. Dev.	124272.4	1.42E+09	2.46E+09	193498.2
Observations	120	120	120	120

Source: *Computed using E-Views 9 Software Package*

Table 1: shows the descriptive statistics of the variables in the study while figure 1 shows the trend analysis. The descriptive analysis gives the characteristics and properties of the time series in terms of mean, median, maximum and minimum values, coefficients of variation etcetera. The trend analysis shows the behavior of each variable over the time. Figure 1 shows the trend analysis of each variable considered in this study.

Figure 1: Trend of Variables used in the model

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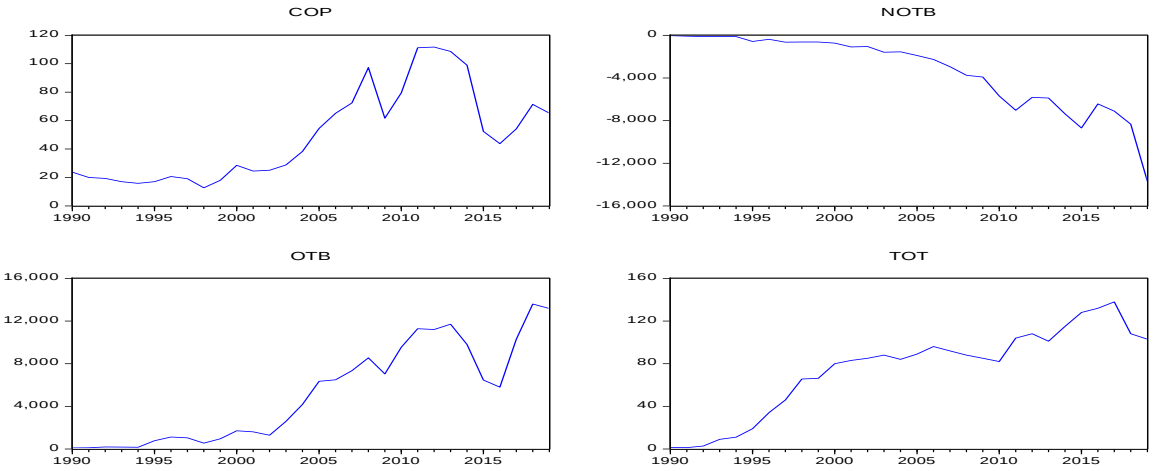

Source: *Computed using E-Views 9.0 Software Package*

4.2.1 Estimating GARCH (1, 1)

Following the trend analysis, the study modeled the extent of volatility using GARCH (1, 1) model. Table 2 summarizes the coefficient of variance equation, used in generating GARCH variance series, named Oil price volatility series.

Table 2: GARCH (1, 1)

	Mean equation		Variance equation			Diagnostics:			ARCH LM test on Models	
Variable	α_0	α_1	η_0	η_1	η_2	AIC	SIC	HQC	F-Statistics	nR^2
GARCH (1,1)	0.002***	0.176**	0.0004***	0.165*	0.793*	-2.003	-1.922	-1.971	0.022***	0.022***

Note: * = 1per cent level of significance; ** = 5per cent level of significance; ***= 10per cent level of significance

Source: *Computed using E-Views 9 Software Package*

As revealed from Table 2, the coefficients of variance – ARCH Effect (η_1) from the GARCH (1,1) model is seen to be significance at 5 per cent level of significance. Thus, we reject the null hypothesis (H_0) of no ARCH effect. Based on the above results, we used the generated GARCH variance series as the oil price volatility series in the study.

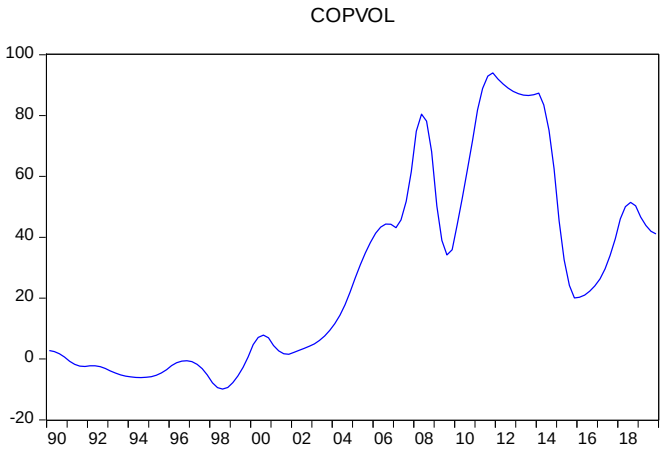

Figure 2: Crude Oil Price Volatility

Source: *Computed using E-Views 9.0 Software Package*

4.2.2 Unit Root Tests

The results of the unit root tests is shown in Table 3

Table 3: Unit root test using the SIC and Newey-West Bandwidth Criterion

Variables	ADF Test Statistic	Longest Lag	Order of Integration	PP Test Statistic	Longest Bandwidth	Order of Integration
COPVOL	-3.974267*	14	I(0)	-3.714131*	4	I(0)
NOTB	-11.11705*	14	I(1)	-10.95364*	5	I(1)
OTB	-20.03443*	14	I(1)	-19.98948*	1	I(1)
TOT	-13.83175*	14	I(1)	-13.88077*	4	I(1)

Source: *Computed using E-Views 9 Software Package*

As seen in table 3, Augmented Dickey Fuller (ADF) test for stationarity at various lag lengths using selected by the SIC criterion shows that LEXRT, LFDOR, and MLR, are not stationary at their levels but stationary at their first difference, while COPVOL is stationary at level. The Philip Perron (PP) test confirms the same results. In addition, the results suggest that the variables need transforming in order to be devoid of spuriousness.

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4.2.3 Co-integration

With the observation that some of the variables have unit root problem, that is, not stationary at their levels, a co-integration test becomes a necessity. We applied the Johansen test for the co-integration test. Table 4is an extract from the co-integration result.

Table 4: Co-integration Test Result

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.46253	361.1595	95.75366	0
At most 1 *	0.356925	236.983	69.81889	0
At most 2 *	0.272348	148.6844	47.85613	0
At most 3 *	0.217986	85.0978	29.79707	0

Source: *Computed using E-Views 9.0 Software Package*

Table 4 shows co-integration result using Johansen Co-integration test. The result indicates 3 co-integrating equation indicating that all the variables are co-integrated at 1% level of significance. This result indicates that there exists a long-run equilibrium relationship among the variables under study.

4.2.4 Structural Equation Estimation

The structural equation specified in the previous section is estimated with the 3SLS technique. The result is presented below.

Table 5. 3SLS Result

System: Estimation
Estimation Method: Three-Stage Least Squares
Sample: 1990Q1 2019Q4
Included observations: 120
Total system (balanced) observations 360
Stacked instruments: (COPVOL,*)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-1362.989	303.7439	-4.487298	0.0000
C(4)	-72.26672	7.190418	-10.05042	0.0000
C(2)	1727.739	242.3294	7.129715	0.0000
C(5)	125.7820	5.736576	21.92632	0.0000

C(3)	53.26100	3.729450	14.28119	0.0000
C(6)	-0.788533	0.088286	-8.931580	0.0000
Determinant residual covariance	5.90E+15			

Equation: TOT = C(1)+C(4)*COPVOL
Observations: 120

R-squared	0.457040	Mean dependent var	-3340.641
Adjusted R-squared	0.452439	S.D. dependent var	3454.347
S.E. of regression	2556.126	Sum squared resid	7.71E+08
Durbin-Watson stat	0.039322		

Equation: OTB = C(2)+C(5)*COPVOL
Observations: 120

R-squared	0.800254	Mean dependent var	5169.891
Adjusted R-squared	0.798561	S.D. dependent var	4543.699
S.E. of regression	2039.298	Sum squared resid	4.91E+08
Durbin-Watson stat	0.034838		

Equation: NOTB = C(3)+C(6)*COPVOL
Observations: 120

R-squared	0.399319	Mean dependent var	74.84000
Adjusted R-squared	0.394228	S.D. dependent var	40.32413
S.E. of regression	31.38481	Sum squared resid	116230.8
Durbin-Watson stat	0.025368		

Source: *Computed using E-Views 9.0 Software Package*

We extracted the following equations below from table 5:

TOT = -1362.989+125.7820COPVOL

t Stat	(-4.487298)	(21.92632)
Prob	(0.0000)	(0.0000)

OTB = -72.26672 + 53.26100COPVOL

t Stat	(-10.05042)	(14.28119)
Prob	(0.0000)	(0.0000)

NOTB = 1727.739 – 0.788533COPVOL

t Stat	(7.129715)	(8.931580)
Prob	(0.0000)	(0.0000)

Where:

TOT is Terms of trade, OTB is Oil Trade Balance, NOTB is Non-Oil Trade Balance, COPVOL is Crude Oil Price Volatility.

A unit change in COPVOL, will results in increase in TOT by approximately 125.7820 unit, while holding other variables constant. The positive sign on COPVOL means that if in oil price swings upward it will improve the

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overall terms of trade. The lower probability value when compared to the conventional level of significance shows that the impact is significant.

A unit change in COPVOL will lead to increase in OTB by 53.26100 units. The result signifies that the change is significant judging by the probability value, which is lower than the conventional 5 percent level of significance.

For Non-oil Trade Balance (NOTB) model, a unit change in COPVOL with other variables held constant would decrease NOTB by approximately 0.788533 units. The probability value is higher than the conventional level of significance, which means the COPVOL coefficient is insignificant for NOTB.

The results from the three equations relating to oil trade balance, non-oil trade balance and terms of trade all indicated the influence of oil price volatility. Thus, the result implies that crude oil price volatility has a significant impact on the Nigerian External Balance via Terms of Trade, Oil Trade Balance and Non-Oil Trade Balance.

5.0 Conclusion and Recommendations

From the findings, it is evident that volatility exists in Crude-oil price, and it has a linkage with Nigerian external balance. The reason is that Oil is a major source of energy in Nigeria accounting for about 80 per cent of the revenue and 90 per cent of the foreign earnings;no surprises as its impact on Terms of Trade and Oil trade balance is significant. The study provides answers to the research questions: is there an existence of volatility in Crude-oil price, if yes, does it significantly impact Terms of Trade and trade balance. This study,therefore, is in agreement with some studies as reviewed in the course of this study to conclude that persistence shock in Crude-oil price is a major determinant of changes in some key macroeconomic variables in Nigeria.

Recommendations

Based on the conclusion drawn and findings in the course of this project particularly the results of the 3SLS model, it is clear that the development of the Nigerian economy is highly dependent on Oil which is no doubt the major source of revenue.

We, therefore, suggest the following recommendations:

i. Government should exploitthe downstream sector of the oil industryto capture additional values from hydrocarbons resources, linking new petrochemical facilities with refineries to capture operational synergies. Expansion into petrochemicals offers the potential for more resilient margins.

ii. Strengthen entrepreneurship through access to finance to encourage innovation and technology to transform the economy from declining and unproductive activities. Here, we support the different

intervention programmes of the Central Bank encouraging entrepreneurship, MSMES, and Agriculture.

iii. Improving quality and standard of Exports to encourage demands towards improving Nigeria's terms of trade.

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Transport, Energy Consumption, Carbon Emission and Economic Policies Uncertainties in Nigeria

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Abstract

Following the need to find a solution to the threat of climate change globally, this study aimed to investigate the effect of transportation energy consumption and economic uncertainty on transport carbon emission covering the period of 1985 – 2020 in Nigeria. The study employed the Autoregressive Distributed Lag technique to achieve the objective. The results showed that transport energy consumption, population growth and economic uncertainty contribute significantly to transport carbon emission in Nigeria. Therefore, the study recommends that the government implement policies that will nudge people to embrace sustainable means of transportation.

Key Words: *Transport carbon emission, Transport energy consumption, Economic Uncertainty ARDL*

1.0 Introduction

Transport infrastructure, either directly or indirectly through its networks, plays a critical role in economic growth.. This is due to its role in facilitating capital and labour inputs in investment and output generation. It strengthens economic activities through its effect on both human and freight mobility. Hence, it affects all human endeavours in all ramifications. Well-maintained infrastructure promotes economic activity and commerce by facilitating the movement of people, goods, services, and vital inputs in the manufacturing process. The ability of countries to produce and export most items destined for regional and global export markets is dependent on land and maritime transportation. Effective transportation modalities, such as good roads, trains, ports, and air transportation, allow entrepreneurs to bring their goods and services to market safely and on schedule.

However, the transportation industry is a major user of fossil fuel energy, emitting nitrous oxide, methane, and carbon dioxide into the atmosphere. Environmental deterioration has resulted from the manufacturing of these chemicals, culminating in global warming and climate change. The terms "global warming" and "climate change" allude to an increase in the worldwide average temperature.,which are major environmental concerns that endanger human life, ecosystems, and health worldwide. ((Akpan & Akpan, 2015).

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Nigeria being a developing country is vulnerable to global warming and climate change. In Nigeria, the problem of climate change is well documented. According to the environmental performance index (2020), Nigeria ranks 100 among 180 countries. This clearly shows that Nigeria is still far in tackling the issue of concern. Millions of people without air conditioning or power are affected by excessive heat, and precipitation fluctuations endanger Nigeria's predominantly rain-fed agricultural sector.

Previous studies in Nigeria have focused on Nigeria's carbon emission determinants by considering economic growth, energy consumption, population urbanisation, and foreign direct investment(Adams et al., 2020; Akpan & Akpan, 2015; Chukwu et al., 2015). To the researchers' best knowledge, little attention has focused explicitly on the concept of discussion. Therefore, the impact of transportation energy use and economic uncertainty on carbon emissions in Nigeria is investigated in this study.

2. Review of Literature

The transport sector still directly accounts for about 24 per cent of carbon emissions from the combustion of fuel globally despite increased use of biofuels, improved energy efficiency and greater electrification. Despite the recent upsurge in carbon emissions from shipping and aviation, about 75 per cent of transport CO_2 emissions come from road transport modes such as buses, cars, trucks, and two-and-three-wheelers(IEA, 2020). CO_2 emissions continued to be on the rise despite significant achievements in the production and the use of electric vehicles. As of December 2019, more than 7 million electric cars are reported on the roads globally, with fleets of electric trucks and buses being deployed majorly in developed countries. According to the recent International Energy Agency report, the increase in transport carbon emissions is largely due to the rising global procurement of heavier and larger vehicles and the growing global economy (IEA, 2020).

For projected freight demand and transport mobility to be met while reducing the growth of CO_2 emissions, coordinated, coherent and integrated policy toolkits is required to set the transport sector on a sustainability track. Many sustainable policy measures and regulations including but are not limited to parking pricing, transit fare subsidies, and shared bicycle systems in the USA, low-emission zone, congestion charging, parking restrictions, and investment in walking and cycling paths in Europe, including the UK, vehicle access restrictions and vehicle registration caps in China (Figure 1.). Compared to other continents, there are no recent policy measures for encouraging low carbon transport alternatives to cars in major African cities despite considerable economic, social, and environmental benefits to the region.

A systematic review of the previous literature has been carried out with the rising body of literature on transportation energy usage and CO2 emissions. Therefore, this section aims to characterise, identify the current state-of-the-art and the gaps in sustainable transport literature. All studies on transport CO_2

emissions and their influencing factors were identified from Scopus and Web of Science. Firstly, we found a total of 95 research papers (i.e., 53 from the web of science and only 42 from the Scopus database) and finally analysed 49 research articles based on inclusion and exclusion criteria.

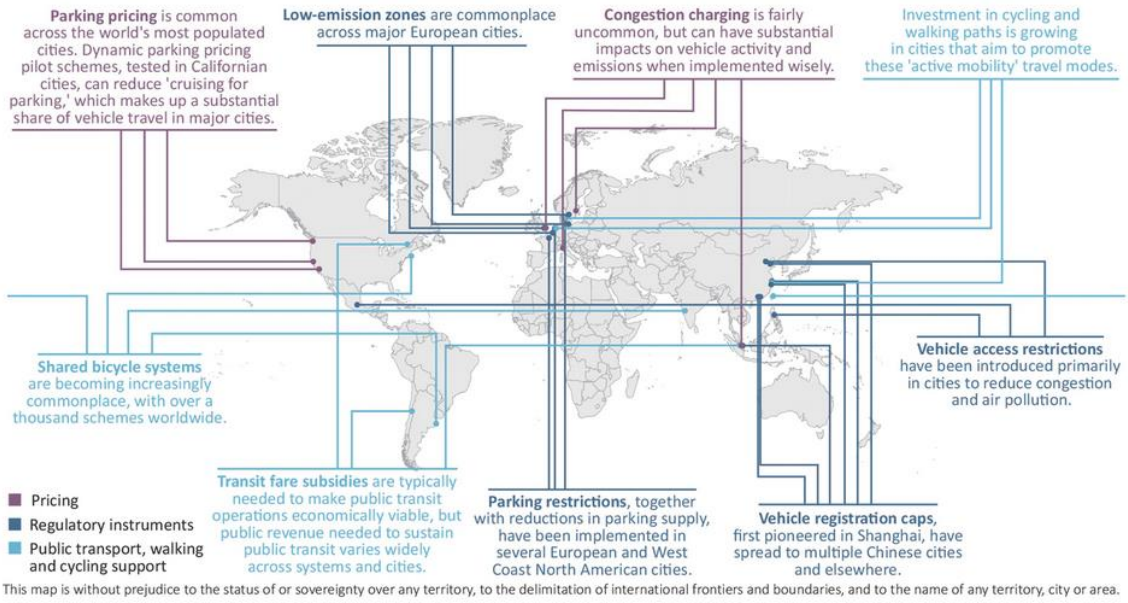

Figure 1: Recent policy instruments promoting sustainable alternatives to car travel in major cities (IEA, 2020)

There are different angles researchers have studied transport carbon emissions. The first strand is related to the factors influencing the transport CO_2 emissions. Transport energy consumption remains the dominant factor influencing the sector carbon emissions (Danish et al., 2018; C. Feng et al., 2020; Li & Zhao, 2015). Simultaneously the framework of the environmental Kuznets curve (EKC) hypothesis was sometimesutilised to establish the impact of the expanding economy on transport CO_2 emissions (Alshehry & Belloumi, 2017; Zhang et al., 2020). It was discovered that the causal relationship between transportation infrastructure and sectoral carbon emissions was bidirectional by Meng & Han (2018) and Tiwari et al. (2020), while Anwar et al. (2021)Lin & Omoju (2017) focused on investment (public-private partnership) as a sustainable way for mitigating emissions in CO_2 in transport. Many studies also identified the rate of urbanisation and population growth as key determinants of transport CO_2 emissions (Lin & Omoju, 2017; Liu et al., 2020; Lv et al., 2019).

With the current pandemic, researchers' attention has been drawn to economic policy uncertainty. For example, Altig et al. (2020) examined economic uncertainty before and during COVID-19 and found that all

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uncertainty indicators increased during the pandemic. Adams et al. (2020) and Pirgaip and Dinçergök (2020) looked into the relationship between energy consumption and CO2 emissions, using economic policy uncertainty as a moderator. The studies discovered a significant link between economic policy uncertainty and CO2 emissions for both rich and developing countries. To our knowledge, no study has attempted to investigate the impact of economic policy uncertainty on the nexus between transportation energy consumption and transport CO_2 emissions, most especially in Nigeria, with only Maduekwe et al. (2020) without consideration of uncertainty. Our research will be the first empirical work to examine the impact of transport energy consumption and economic uncertainties on transport carbon emissions in Nigeria.

3. Methodology

The study adopted the(Sulaiman& Abdul-Rahim, 2018) model, which was used to measure the relationship between carbon emission, income, energy consumption, and population growth. However, the model was modified using transport carbon emissions measured in metric tonnestoreplace the general carbon emission. In addition,economic uncertainty added to the independent variables due to the objective of the present study. Hence, the empirical model for this study is presented in equation 1:

3.1.Model Specification

the study used the following models, to empirically investigate the effect of transport energy consumption and economic uncertainties on transport carbon emission,:

$TCO_2t = \beta0 + \beta_1ECt + \beta_2TECt + \beta_3POPG + \beta_4EPUt + \varepsilon t$……..1

Where :

TCO_2= transport carbon emissions (in millions metric tons)

EG = Economic Growth

TEC = Transport Energy Consumption

POPG = Population Growth

EPU = Economic Policies Uncertainty

εt is the regression error term.

Factors 1, 2, 3, and 4 indicate the effects of economic growth, transportation energy consumption, and economic policy uncertainty on CO2 emissions from transportation, respectively.

All the variables were transformed into logarithm as:

$\ln TCO_2t = \beta0 + \beta_1 \ln EGt + \beta_2 \ln TECt + \beta_3POPG + \beta_4EPUt + \varepsilon t$……..2

3.2 Sources of Data:

Secondary data were used for this study spanning 1985 and 2020. Energy transport carbon emission and transport energy consumptionproxied by energy consumption, real gross domestic product per capita and population were obtained from world development bank indicators, and economic policy uncertainty was sourced from the world uncertainty index.

3.3 Estimation Technique

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This study employs the Autoregressive distributed lag technique to investigate the effect of transport energy consumption and economic uncertainty on transport carbon emission in Nigeria. The ARDL technique is suitable for a model in which the unit root test is integrated of values not greater than one, i.e. the variables are stationary at levels and first difference.

The ARDL have different procedures. The first stage is to conduct the unit root test to determine the stationary properties of each variable. The second procedure is to determine a long-run relationship between the regressand and regressors within a univariate framework. The final procedure is to estimate an error correction model if the variables are cointegrated.

4. Empirical Results

This section presents the empirical results on the effect of transportation energy consumption and economic policy uncertainty on transportation carbon emissions are presented in this section.

4.1. Unit Root Test

Table 1 shows the results of the unit root test. The Augmented Dickey-Fuller Test was used to conduct the unit root test (ADF). The result reveals a zero and one mixed integrating order. Only population growth is integrated at order zero, i.e. I(0), whereas all other variables are integrated at order one, as shown. As a result, the adoption of the ARDL approach was justified.

Table 1: Unit Root Test

Variable	Augmented Dickey-Fuller Test	Level of Integration		
	Level	First difference	Critical value (5%)	
LnTCO	-0.99873	-5.94466**	-2.93113	I(1)
LnTEC	-1.20479	-5.88159**	-2.94102	I(1)
LnEG	-0.0291	-3.394459**	-2.94584	I(1)
LnPOPG	-3.737193**		-2.95402	I(0)
LnEPU	-0.0872	-5.776998**	-2.94115	I(1)

Notes: ** denotes significance at 5%

Authors' Computations, 2021

4.2. ARDL Result

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The ARDL result is presented in Table 2 based on Akaike Information Criteria (AIC). The result reveals that the lag value of transport carbon emission is positive but not significant. The instantaneous effect is insignificantly negative, while the lag value has a significant negative effect on carbon emission. The coefficient of transport energy consumption, population growth, and economic uncertainty significantly affect transport carbon emissions in Nigeria. This means that a 1% increase in transportation energy consumption in Nigeria will result in a 0.58 percent rise in transportation energy consumption.

In addition, a one per cent increase in economic uncertainty will also aggravate an increase in transport carbon emission. The coefficient of determination ($R^{2)}$ shows that variations in all the explanatory variables explain 92 per cent of the variation in transport energy consumption. The F-Statistic Value of the model is also significant. In addition, the Durbin Watson statistic shows that the model is free from serial correlation.

Table 2: ARDL Result

Dependent Variable: LOG(TCO)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOG(TCO(-1))	0.087845	0.172259	0.509961	0.6142
LOG(EG)	-0.06599	0.084105	-0.78465	0.4395
LOG(EG(-1))	-0.14785	0.062874	-2.35156	0.0262
LOG(TEC)	0.579211	0.142163	4.074287	0.0004
LOG(POPG)	0.356605	0.096952	3.678166	0.001
LOG(EPU)	0.046113	0.020884	2.207999	0.0359
LOG(EPU(-1))	0.020627	0.018611	1.108296	0.2775
C	-2.8994	0.983023	-2.94948	0.0065
R-squared	0.917788			
Adjusted R-squared	0.896474			
F-statistic	43.0598			
Prob(F-statistic)	0			
Durbin-Watson stat	2.148115			

Source: Authors' Computation, 2021

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4.3. Bound Test

Table 3 displays the results of the bound test. At a 5% significance level, the estimated F-statistic (4.51) is greater than Pesaran's critical lower bound value of 2.86 and upper bound value of 4.01. As a result, the null hypothesis of no cointegration is ruled out. As a result, it is argued that the dependent and independent variables in the model have a long-run cointegration relationship.

Table 3: ARDL Bounds Test

Test Statistic	Value	K
F-statistic	4.51178	4

Source: Authors' Computation, 2021

4.4. Long and Short-run Results

Table 3 shows the short-run coefficients of the effect of energy consumption on transportation carbon emissions. Apart from economic growth, all other explanatory variables, such as transportation energy consumption, population expansion, and economic policy uncertainty, had a significant positive effect on transport carbon emissions in both short and long-run models during the time under consideration. According to the findings, a 1% increase in transportation energy consumption results in a 0.57 percent rise in transportation carbon emissions. The long-run result backs up this conclusion.As shown in Table 4, a 1% increase in transportation energy consumption will result in a 0.63 percent rise in transportation carbon emissions over time.

Furthermore, the results demonstrate that a 1% rise in population growth corresponds to 0.35 and 0.39 percent increases in the short and long-run models, respectively. The economic uncertainty coefficient shows that a 1% rise in economic uncertainty increases transportation carbon emissions by 0.05 and 0.07 percent in the short and long run.

The ECM coefficient is also negative as expected and statistically significant as dictated by the p-value (0.000) and the t-statistic (-5,295255). The result shows that about 91 per cent of disequilibrium in the transport carbon emission in the previous year are corrected for in the current year. The significance of the ECM is a confirmation of the existence of along run equilibrium between transport carbon emission and transport energy consumption, and economic uncertainty.

Table 4: Short and Long Run Result

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Dependent Variable: LOG(TCO)				
Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(EG)	-0.06599	0.084105	-0.78465	0.4395
DLOG(TEC)	0.579211	0.142163	4.074287	0.0004
DLOG(POPG)	0.356605	0.096952	3.678166	0.001
DLOG(EPU)	0.046113	0.020884	2.207999	0.0359
CointEq(-1)	-0.91216	0.172259	-5.29526	0

Cointeq = LOG (CO) - (-0.2344*LOG (RGDP) + 0.6350*LOG (TEC) +

0.3909*LOG (POPG) +0.0732*LOG (EPU) -3.1786).

Table 5 Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(EG)	-0.23444	0.062613	-3.74424	0.0009
LOG(TEC)	0.634992	0.146562	4.332591	0.0002
LOG(POPG)	0.390948	0.105714	3.698172	0.001
LOG(EPU)	0.073167	0.008564	8.543226	0
C	-3.17863	1.16659	-2.72472	0.0112

Source: Authors' Computation, 2021

4.5. Diagnostic Tests

The model's adequacy was tested using the serial correlation test and the normalcy test, with the findings shown in Table 6 and Figure 1, respectively.

4.5.1 Serial Correlation Test

To see if the variables were serially correlated, the Breusch-Godfrey Serial Correlation LM Test was employed. Table 6 reveals that the R-squared value and F-statistics probability are more than 0.05; thus, we accept the null hypothesis and reject the alternative hypothesis, concluding that error terms are not serially connected. It shows that the subsequent values of the error term are unconnected to their earlier values, indicating that the residual is desirable.

Table 6 Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.319027	Prob. F(2,25)	0.7298
Obs*R-squared	0.871043	Prob. Chi-Square(2)	0.6469

Source: Authors' Computation, 2021

4.5.2. The Normality test

Figure 2 shows the result of the normalcy test. The Jarque-Bera statistic (2.469561) demonstrates that the residual is normally distributed, with a probability (0.280899) value greater than 0.05. (Five per cent). This shows that the normal distribution null hypothesis should be accepted.

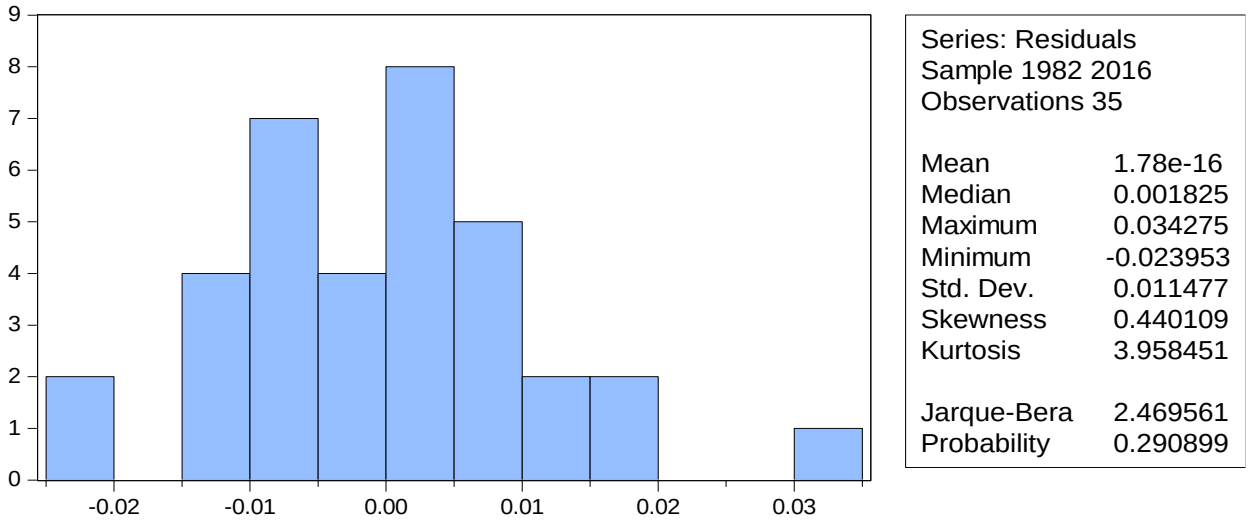

Figure 2: Normality test

4.6. Discussion of Findings

Based on the global concern on the increase in global warming and the threat to climate change due to the increase in carbon emission in general and transport carbon emission in particular. Therefore, this research was conducted to join other researchers in identifying the major determinants of transport carbon emission in Nigeria.

The study results showed that transport energy consumption, population growth, and economic uncertainty significantly positively impact transport carbon emission in Nigeria. This means that the higher the level of transport energy consumption, population growth and economic uncertainty, the higher the increase in transport carbon emission in Nigeria. This result is in tandem with the study of Sulaiman & Abdul-Rahim, (2018), Adams et al. (2020) and Amin &Dogan (2021).

5. Conclusion and Recommendation

This study analysed the effect of transport energy consumption and economic uncertainty on transport carbon emissions in Nigeria between 1985 and 2020. The findings

of the result based on the Autoregressive Model technique suggests transport energy consumption, population growth and economic uncertainty contribute positively to transport carbon emission in Nigeria.

The first implication of the result is that the higher the level of transport energy consumption, the greater the transport carbon emission and, consequently, the worse the climate condition in Nigeria. In addition, the greater the increase in population growth and economic uncertainty, the higher the level of transport carbon emission in Nigeria.

Therefore, this study recommends the use of economic policies that will nudge people to embrace sustainable transportation. The government can achieve this by subsidising people who patronise public transport instead of their private car. In order words, the government should promote a sustainable transportation system by encouraging people to embrace energy-efficient means of transportation.In addition, the government should optimise the positive effect of economic uncertainty on transport carbon emission.

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Impact of Exchange Rate on Inflation in Nigeria: Symmetric and Asymmetric Analyses

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Abstract

Inflation is a variable that is of importance to any economy. It can causes distortion in economic planning and development. Due to its key roles in the economy, government needs to consistently put it under checks so as to avoid economic fluctuations. Therefore, this study investigated the aggregated impact of exchange rate as one of the determinants of inflation rate in Nigeria. The study employed Non-Linear ARDL estimation technique to examine the positive and negative impact of exchange rate on inflation rate, using monthly time series data that cover the period of January, 1996 and December, 2020. It was found in the study that expected inflation or lag of inflation has positive impact on inflation in the short-run in Nigeria. It is also found that exchange rate has symmetric impact on inflation rate in the short-run in Nigeria while it has positive impact on food inflation (FINF) and head-line Inflation (HLINF) in the short-run. It is also found in the study that the impact of rainfall on inflation rate is negative in the short-run in Nigeria. Then, the study recommends that the study recommend that authority should put in place exchange rate and price harmonization institution that will ensure that exchange rate pass-through occurs at the time when Naira appreciates and depreciates. This is to control the producers from charging excessive prices, especially when the cost of production has fallen due to appreciation of Naira.

Key Words: *Exchange rate, Inflation, Time series, Non-linear ARDL and Nigeria.*

Introduction

One of the major issues of Nigerian economy is how to control inflation rate. The control of it has been linked to the monetary policy and fiscal policy as shown in a number of budget and policy statements in Nigeria (Egwaikhide, Chete & Falokun, 1994). The level of inflation dated back to 1970, when the revenue accruing to the government from the oil resource, rose consistently. With the increase in public expenditure, due to increase in oil revenues, there was vast expansion in aggregate demand. With the inelastic supply of domestic output, inflation inevitably resulted (Egwaikhide et al. 1994). Viewing it from another perspective, as Nigeria is notably an import-dependent economy, prices of domestically produced goods changes as a result of changes in exchange rate of Naira to US Dollars in

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foreign exchange market. It is generally believe that when Naira depreciates in value compared to US Dollars, prices of local commodities increases. But, when the value of Naira appreciates in foreign exchange market, the prices of domestic commodities should come down, as the appreciation of Naira should bring about a fall in cost of production to producers, who import raw materials from abroad. The fall in cost of production will lead to increase in profit of producers. Consequently, the producer will be reluctant in reducing the price so as not to reduce his profit margin.

The general believe that when Naira depreciates, it results into a rise in the prices of goods in the domestic economy, and when it appreciates, it is expected to lead to a fall in the prices of goods in domestic economy. But in reality, the producers or entrepreneurs hardly reduce the price of items in Nigeria, especially when the appreciation of Naira is small. The authorities need to take some measures that will safeguard the consumers against the reluctance of entrepreneurs in reducing the prices of goods when the cost of production has fallen due to appreciation of local currency in foreign exchange market. But for them to create any measure against the attitude of the entrepreneurs, they need to be guided by scientific studies that will give them insight on the nature of positive and negative change in exchange rate. So, the study intend to find out if positive and negative changes in exchange rate of Naira to US Dollars affect inflation rate, and specifically to find out if there is exchange rate pass-through in the cases of both positive and negative changes in the exchange rate.

The research questions is: does exchange rate has both positive and negative impact on inflation? The general objective is to examine the impact of exchange rate on inflation rate while the specific objectives are to analyze the disaggregated effect of exchange rate on inflation rate in Nigeria. The hypothesis in the study is H_0: exchange rate has no disaggregated impact on inflation rate in Nigeria. The justification of the study lies in the fact that if it is found that exchange rate has positive and negative impact on prices of goods in domestic market, authorities are expected to put in place measures that will facilitate the safeguard of consumers from being exploited by the entrepreneurs when Naira appreciate in value in the foreign exchange market by reducing the prices of goods locally. Choosing Nigeria as a case study, is to have an in-depth analysis of the disaggregated impact of exchange rate on inflation rate. This serves as geographical scope of the study. The study does not employ all the variables that affect inflation for the avoidance of multicollinearity in the estimated model; and this is the variable scope of the study. The data employed in the study is time series data which covers the period of January, 1996 to December, 2020. The choice of the period is based on data availability. Limitation of the study lies in the non-availability of data beyond December, 2020.

2.1 Literature Review

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This section covers discussion on theoretical review, which is found in Sub-section 2.2; empirical review, which is in Sub-Section 2.3 and research gap , which is found in Sub-section 2.4.

2.2 Theoretical Review

This sub-section is divided into four paragraphs, each paragraph discusses each theory in the section. Phillips Curve is discussed in paragraph one, while Monetary Theory of Inflation is discussed in paragraph two. Keynesian Theory of Inflation and New Keynesian Phillips Curve are discussed in paragraph three and four respectively.

Phillip's Curve: It a form of theory on inflation rate that explain the relationship between unemployment inflation. Phillips (1958) showed the existence of relationship between unemployment and wage rate, using the statistical data from United Kingdom that span between 1862 – 1957. It is established through the empirical investigation that inverse relationship exists between unemployment and wage rate of labour. This implies that when unemployment is high, the rate of increase in money wage rate (inflation) is low, and vice versa. This is based on the assumption that wages and prices move in the same direction.

Monetary Theory of Inflation: The monetarists believe that inflation is a monetary phenomenon. They emphasised that inflation rate is determined by increase in cash balances of the people as a result of increase in nominal income. Its earliest explanation is to be found in the simple quantity theory of money. The monetarists employed the notable identity of Fisher's Equation of Exchange:

$$MV = PQ \quad \ldots\ldots 2.1$$

Where M is the money supply, V is the velocity of circulation, P is the price level and Q is the level of real output (Jhingan, 2002). Assuming V and Q are constant, the price level (P) varies proportionately with the supply of money (M). With flexible wages, the economy is believed to operate at full employment level. The labour force, the capital stock and technology also changed only slowly over time. Consequently, the amount of money spent in the economy did not have effect on the real output level. So, if money supply is doubled, it will result into doubling of price level. Therefore, according to the monetarists, inflation rate is mainly determined by money supply.

Keynesian Theory of Inflation: To Keynes and his followers, they emphasised the increase in aggregate demand as the source of inflation. Aggregate demand comprises consumption, investment and government expenditures. If aggregate demand exceeds aggregate supply at the full employment level, the inflationary gap arises. The larger the gap between aggregate supply and demand, the more rapid the inflation. According to Keynesians, given a constant average propensity to save, rising money incomes at the full employment level would lead to excess of aggregate demand over aggregate supply and consequently to inflationary gap. The theory is based on the

short-run analysis in which prices are assumed to be fixed. Keynesians views on causation chain between nominal money income and inflation or prices is an indirect one through the rate of interest. The increase in nominal money income (money supply) leads to fall in interest rate, which will lead to increase in investment and in turn leads to aggregate demand increase. The increase in aggregate demand cannot lead to increase in output, if the economy is at full employment level, but will lead to increase in the price level (inflation)

New Keynesian Phillip's Curve: According to the proponents of NKPC model, inflation is determined by inflation expectation and real marginal costs, which is the expenses firms must make in the process of production for extra unit of their goods or services. It implies that inflation is determined by expected inflation rate (π_{t+1}) and marginal cost of production. Of course, the expectation of inflation by firms is based on rational expectation, which make use of the adaptive expectation and the future information about changes in wage rate.

2.3 Empirical Review

In a study on inflation, exchange rate depreciation and budget deficit in Nigeria, Egwaikhide, Chete and Falokun (1994) analysed the impact of exchange rate depreciation on inflation, using Error Correction Mechanism (ECM), with data that range from 1973 - 1989. The study measures inflation as CPI and exchange rate depreciation as lagged value of exchange rate. The control variables in the model specified in the study include money supply, real GDP, government revenue and expenditure, external debt, Then, it found that the exchange rate coefficient is positive and highly significant, which implies that depreciation of exchange rate exert positive influence on inflation rate.

In another study, Restrepo (2003) examined the price inflation and exchange rate pass-through in Chile, using data that span between 1986:1 to 2001:1, employing linear quadratic adjustment cost (LQAC) models. The study use the price level (excluding the price of items such as food perishable items, fuels, gas and regulated services), labour productivity, private wage, public wage, general wages, exchange rate and difference between actual output and Hodrick-Prescott's output (output gap). It found that exchange rate depreciation has upsurge impact on inflation rate in Chile, while such increase is neutralized by increase in output.

Study by Nogueira (2007) analysed the exchange rate pass-through for a set of emerging and developed economies before and after the adoption of inflation targeting. Both short-run and long-run ARDL were employed to estimate the impact of exchange rate depreciation on producer and consumer prices. Monthly data on consumer and producer prices were sourced and used as dependent variables. The explanatory variables include changes in exchange rate, monthly output growth using industrial production index and changes in the unit of value of foreign prices of imports. The study

found that exchange rate pass-through declined after inflation targeting for consumer and producer price indices. It is concluded in the study that the reduction does not imply that the exchange rate pass-through is no longer in existence, especially over the long-run.

In another study, Charles and Chilaka (2019) analysed the effects of exchange rate on inflation in Nigeria for the period of 1981 – 2015. The study employed inflation rate, which is expressed as CPI, and which serves as the dependent variable in the study. The explanatory variables are exchange rate which is expressed as the rate at which a US dollar is exchanged for a Naira, non-oil export foreign exchange earnings and money supply. It employed Vector Error Correction Mechanism (VECM) and found that the exchange rate has impact on inflation in Nigeria. Then, the study concluded that efforts should be intensified by the government to increase the foreign exchange earnings emanating from non-oil exports in order to increase the foreign reserves of the country and forestall incessant depreciation of Naira.

In addition, the study by Ude and Anochie (2014) on monetary policy and price stability, using quarterly data from 1986:1 to 2012:4, found incomplete exchange rate pass-through with price stability. This is almost the same with findings of Hunegnaw (2012), Berga (2012), Ecevit and Kayham (2011) etc.

In a study on the impact of exchange rate depreciation on inflation in Nigeria from 1986 - 2008, Imimole and Enoma (2011) employed Auto Regressive Distributed Lag (ARDL) co-integration procedure to analyse the study. The dependent variable in the study is inflation rate while the explanatory variables are one-year lag-value of Nigeria inflation rate, nominal exchange rate of Naira to US Dollars, nominal money supply, government expenditure and real GDP, all expressed in natural log form. The study found that exchange rate depreciation, money supply and real gross domestic product are the main determinants of inflation in Nigeria and the impact of Naira depreciation is positive in the long-run. The study concluded that although Naira depreciation is a policy that is efficacious for promotion of exportable goods but should not be relied upon as a viable measure for controlling inflation in Nigeria.

The study by Audu and Amaegberi (2013) on exchange rate fluctuations and inflation targeting in Nigeria used inflation rate as the dependent variable, while exchange rate and interest rate are employed as explanatory variables. The data were analysed using Error Correction Mechanism (ECM), and it is found that interest rate positively influence inflation rate while exchange rate has negative influence on it. However, the model of the study might have omission of important variables as only exchange rate and interest rate are considered as the factors that determine inflation rate. Such omitted variables include money supply, GDP, average rainfall etc.

In an investigation on the impact of exchange on inflation in Nigeria, Abubakar, Apeh and Nweze (2021) employed inflation rate as the

dependent variable in the study while one year lag of inflation rate, exchange rate (in terms of Naira to US Dollar), GDP per capita, broad money supply and government expenditure are the explanatory variables. The study employed ARDL as an estimation technique and subsequently found that the lags of all the explanatory variables in the model have impact on the rate of inflation. It also found that long run relationship exist between inflation rate and the explanatory variables employed in the study. However, the study did not include, in its analysis, the impact of variables such as rainfall and interest rate, which some studies (e.g. Audu and Amaegberi, 2013) have found to have impact on inflation rate.

The study by Osabuohien, Obiekwe, Urhie and Osabohien (2018) on the exchange rate fluctuations and inflation in Nigeria found that parallel market exchange rate has pass-through effect on inflation in the short-run as official exchange rate has pass-through effect on inflation in the long-run. The estimation technique used by the study is Generalized Autoregressive Conditional Heteroscedasticity (GARCH) and Vector Autoregressive (VAR) model, employing monthly time series data that span between January, 2006 and December, 2015. The dependent variable used in the study is inflation rate while the explanatory variables include exchange rate volatility, broad money supply, interest rate, oil price, official exchange rate and parallel exchange rate.

Also, Nwaru and Eke (2017) analysed the impact of exchange rate on inflation in Nigeria, employing annual data for the period of 1970 – 2014. The study employed inflation rate as the dependent variable while employing lagged value of inflation, exchange rate, money supply and import prices as explanatory variables. It found that all the regressors have impact on inflation rate.

In addition, Emerenini, and Eke (2014) examined the determinants of inflation in Nigeria, using OLS estimation technique for monthly data from January, 2007 to August, 2014. Expected inflation, money supply and exchange rate were employed as explanatory variables while inflation rate was employed as dependent variable. The study found that exchange rate, expected inflation and money supply influence inflation rate.

In a separate study on inflation rate and exchange rate in Nigeria, Inyiama and Ekwe (2014) assessed the impact of exchange rate on inflation rate in Nigeria between 1979 and 2010, using Ordinary Least Square (OLS) estimation technique. The study employed inflation rate as the dependent variables while employing exchange rate, gross domestic product, interest rate and inflation rate as explanatory variables. It found that exchange rate has positive impact on inflation in Nigeria. However, the study missed up the procedural processes as the study applied OLS for non-stationary series, even with different order of integration. It excluded some important determinants of inflation rate including expected inflation rate and money supply.

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2.4 Gap in Literature

A number of studies have reviewed the impact of exchange rate on inflation in Nigeria and other countries, using different econometrics techniques such as OLS, ARDL, ECM, ARCH and GARCH etc. but there is no extant study, as far as the researcher know, especially from Nigeria, that has employed non-linear autoregressive distributed lag (NLARDL). The method is applied to analyse the disaggregated impact of exchange rate on inflation in Nigeria (that is, positive and negative impact of exchange rate). Also, this study will be the first, as far as the researcher know, apart from Sani, Ismaila, Danlami and Sani (2020), that employed average rainfalls as one of the factors that determine inflation rate.

Methodology

This section discusses the methodology of the study including theoretical framework, model specification, estimation techniques, diagnostic tests and nature, measurement and coverage of variables.

3.1 Theoretical Framework

The study is premised on the Keynesian Theory of inflation, Monetary Theory of inflation and New Keynesian Phillips Curve Model.Keynesian theory emphasised that inflation is determined by the increase in aggregate demand over and above aggregate supply. The monetary theory stressed the role of money supply or increase in cash balances without proportionate increase in output as a determinant of inflation. The **NKPC** describes a simple relationship between inflation, the expectation that firms hold about future inflation, and real marginal costs, that is, the real (adjusted for inflation) resources that firms must spend to produce an extra (marginal) unit of their good or service. It states that **inflation** is a function of two factors: Next period's expected **inflation** rate, (π_{t+1}) and MC.

The models of the study include the four variables in those theories mentioned above, which include the aggregate demand and supply, which is proxied as GDP, money supply, marginal cost of producing goods, which is proxied as interest rate (i.e. cost of capital) and expected inflation, which is proxied as lag of inflation rate. Also, Average rainfall is included in the models as one of the variables that determines inflation rate. The models are in three categories based on the three different measures of inflation viz: core inflation, headline inflation and food inflation. Therefore, three models are specified for the study and are as below.

3.2 Model Specification

$$CINF_t = \beta_{01} + \beta_{11}EXRt + \beta_{21}GDPt + \beta_{31}M_2t + \beta_{41}INTt + \beta_{51}ARFt + \beta_{61}CINFt_{-1} + \mu_{t1....} \quad \ldots\ldots 3.1$$

$FINF_t = \beta_{02} + \beta_{12}EXRt + \beta_{22}GDPt + \beta_{32}M_2t + \beta_{42}INTt + \beta_{52}ARFt + \beta_{62}FINFt_{-1} + \mu_{t2}$ …..……3.2

$HLINF_t = \beta_{03} + \beta_{13}EXRt + \beta_{23}GDPt + \beta_{33}M_2t + \beta_{43}INTt + \beta_{53}ARFt + \beta_{63}HLINFt_{-1} + \mu_{t3}$ …..…3.3

Apriori expectation: β_1, β_3, β_4 and $\beta_6 > 0$and β_2 and $\beta_5 < 0$

The dependent variables are three, including $CINF_t$, $FINF_t$ and $HLINF_t$, which are different measures of inflation rate. $CINF_t$ is the core inflation, which is expressed as the inflation rate of all baskets of goods except food and energy. $FINF_t$ is food inflation, which is expressed as inflation rate for only food items while $HLINF_t$ is headline inflation, which is expressed as inflation rate for all baskets of goods without exception.

The explanatory variables are EXR_t, GDP_t, M_{2t}, INT_t, ARF_t $CINF_{t-1}$, $FINF_{t-1}$ and $HLINF_{t-1}$. Exchange rate is represented by EXR_t, Gross Domestic Product is denoted as GDP_t, M_{2t}, represents money supply; INT_t represents interest rate while ARF_t represents average rainfall; $CINF_{t-1}$, $FINF_{t-1}$ and $HLINF_{t-1}$ represent expected inflation in core, food and headline inflation.

The justification for inclusion of exchange rate (EXR_t), Gross Domestic Product (GDP_t) and money supply (M_{2t}) is based on the thrust of Monetary Theory of Inflation, Keynesian Theory of Inflation and New Keynesian Phillips Curve (NKPC) while the inclusion of average rainfall (ARF_t) rainfall is born out of the fact that, in reality, food and agricultural items production depends on the volume of rainfall in the year.

With reference to the adopted estimation technique, because the study is interested in looking at the disaggregated effect of exchange rate on inflation rate in Nigeria (i.e. negative and positive effect of exchange rate on inflation, which is known as asymmetries), Non-Linear ARDL which is put forth by Shin, Yu and Greenwood-Nimmo (2014) will be employed. Shin et al. (2014) presented a non-linear ARDL approach (NARDL) as an extension to the notable ARDL model developed by Pesaran, Shin and Smith (2001) to capture asymmetries in modelling.

To capture the asymmetric impact of exchange rate on inflation, we specify a non-linear model by decomposing the variable ($EXCR_t$) into positive and negative shocks as follows:

$$EXR_t = EXR_t^+ + EXR_t^- \quad \text{……3.4}$$

$$EXR_t^+ = \sum_{j=i}^{t} \Delta EXR^+ = \sum_{j=i}^{t} \max \Delta EXR_{j,}0 \quad \text{……..3.5}$$

$$EXR_t^- = \sum_{j=i}^{t} \Delta EXR^- = \sum_{j=i}^{t} \min \Delta EXR_{j,}0 \quad \text{……....3.6}$$

Putting equation 3.4 into 3.1 – 3.3, we derive the equation below

$CINF_t = \beta_{07} + \beta^{+}_{17}EXR_t^{+} + \beta^{-}_{17}EXR_t^{-} + \beta_{27}GDP_t + \beta_{37}M_{2t} + \beta_{47}INT_t + \beta_{57}ARF_t + \beta_{67}CINFt_{-1} + \mu_{t1}$……..3.7

$FINF_t = \beta_{08} + \beta^{+}_{18}EXR_t^{+} + \beta^{-}_{18}EXR_t^{-} + \beta_{28}GDP_t + \beta_{38}M_{2t} + \beta_{48}INT_t + \beta_{58}ARF_t + \beta_{68}FINF_{t-1} + \mu_{t2}$……..3.8

$HLINF_t = \beta_{03}\ \beta^{+}_{19}EXR_t^{+} + \beta^{-}_{19}EXR_t^{-} + \beta_{29}GDP_t + \beta_{39}M_{2t} + \beta_{49}INT_t + \beta_{59}ARF_t + \beta_{69}HLINF_{t-1} + \mu_{t3}$ ……3.9

In a bid to express more useful dynamics in the model, the study expresses equations (3.7) - (3.9) in autoregressive distributed lag (ARDL) model as shown in equations (3.10) - (3.12). Equations (3.10) - (3.12) are ARDL as put forth by Pesaran et al., (2001) while Equations 3.13 – 3.15 are usually described as a non-linear (asymmetric) ARDL model due to the disaggregated exchange rate (see Shin et al., 2014).

$$\Delta CINF_t = \beta_{010} + \sum_{i=0}^{t}\beta_{110}\Delta EXR_{t-i} + \sum_{i=0}^{t}\beta_{210}\Delta GDP_{t-i} + \sum_{i=0}^{t}\beta_{310}\Delta M_{2t-i} + \sum_{i=0}^{t}\beta_{410}\Delta INT_{t-i} + \sum_{i=0}^{t}\beta_{510}\Delta ARF_{t-i} + \sum_{i=1}^{t}\beta_{610}\Delta CINF_{t-i} \dots\dots\dots\dots 3.10$$

$$\Delta FINF_t = \beta_{011} + \sum_{i=0}^{t}\beta_{111}\Delta EXR_{t-i} + \sum_{i=0}^{t}\beta_{211}\Delta GDP_{t-i} + \sum_{i=0}^{t}\beta_{311}\Delta M_{2t-i} + \sum_{i=0}^{t}\beta_{411}\Delta INT_{t-i} + \sum_{i=0}^{t}\beta_{511}\Delta ARF_{t-i} + \sum_{i=1}^{t}\beta_{611}\Delta CINF_{t-i} \dots\dots\dots\dots 3.11$$

$$\Delta HLINF_t = \beta_{012} + \sum_{i=0}^{t}\beta_{112}\Delta EXR_{t-i} + \sum_{i=0}^{t}\beta_{212}\Delta GDP_{t-i} + \sum_{i=0}^{t}\beta_{312}\Delta M_{2t-i} + \sum_{i=0}^{t}\beta_{412}\Delta INT_{t-i} + \sum_{i=0}^{t}\beta_{512}\Delta ARF_{t-i} + \sum_{i=1}^{t}\beta_{612}\Delta CINF_{t-i} \dots\dots\dots\dots 3.12$$

$$\Delta CINF_t = \beta_{013} + \sum_{i=0}^{t}\beta^{+}_{113}\Delta EXR^{+}_{t-i} + \sum_{i=0}^{t}\beta^{-}_{113}\Delta EXR^{-}_{t-i} + \sum_{i=0}^{t}\beta_{213}\Delta GDP_{t-i} + \sum_{i=0}^{t}\beta_{313}\Delta M_{2t-i} + \sum_{i=0}^{t}\beta_{413}\Delta INT_{t-i} + \sum_{i=0}^{t}\beta_{513}\Delta ARF_{t-i} + \sum_{i=1}^{t}\beta_{613}\Delta CINF_{t-i} \dots\dots\dots\dots 3.13$$

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$$\Delta FINF_t = \beta_{014} + \sum_{i=0}^{t} \beta_{114}^{+} \Delta EXR_{t-i}^{+} + \sum_{i=0}^{t} \beta_{114}^{-} \Delta EXR_{t-i}^{-} + \sum_{i=0}^{t} \beta_{214} \Delta GDP_{t-i} + \sum_{i=0}^{t} \beta_{314} \Delta M_{2t-i} + \sum_{i=0}^{t} \beta_{414} \Delta INT_{t-i} + \sum_{i=0}^{t} \beta_{514} \Delta ARF_{t-i} + \sum_{i=1}^{t} \beta_{614} \Delta FINF_{t-i} \dots \dots \dots \dots 3.14$$

$$\Delta HLINF_t = \beta_{015} + \sum_{i=0}^{t} \beta_{115}^{+} \Delta EXR_{t-i}^{+} + \sum_{i=0}^{t} \beta_{115}^{-} \Delta EXR_{t-i}^{-} + \sum_{i=0}^{t} \beta_{215} \Delta GDP_{t-i} + \sum_{i=0}^{t} \beta_{315} \Delta M_{2t-i} + \sum_{i=0}^{t} \beta_{415} \Delta INT_{t-i} + \sum_{i=0}^{t} \beta_{515} \Delta ARF_{t-i} + \sum_{i=1}^{t} \beta_{615} \Delta HLINF_{t-i} \dots \dots \dots \dots 3.15$$

3.3 Estimation Technique

In order to know the nature of the data employed in the study, it carries out the descriptive statistics and trend analysis of the variables employed in the study. The descriptive and trend analysis are presented in Section Four of the study. In line with the objective of the study, which is analysing the disaggregated impact of exchange rate on inflation in Nigeria, econometrics techniques employed to estimate the models in the study is Non-linear Autoregressive Distributed Lag (NLARDL). The diagnostic tests employed to test the robustness of the estimates in the study are Breusch-Pagan-Godfrey test of heteroscedasticity, Breusch-Godfrey test of serial correlation, Jarque-Bera test of normality of residuals, Multicollinearity test, Ramsey Reset test of model misspecification test.

3.4 Sources and Measurement of Data

a) Inflation Rate: It is divided into three areas of measurements viz: food inflation, core inflation and headline inflation. Core inflation rate is represented as inflation rate for all baskets of goods with exception of food and energy. Food inflation Rate represents the inflation rate of food items alone, while headline inflation rate is expressed inflation rate as for all the basket of goods in the economy, without exception. The data are monthly time series, which are sourced from the CBN online data bank.

b) Exchange Rate: The average rate at which naira is exchanged for a US dollar in a particular month, which is measured as the change in the nominal exchange rate that is sourced from the CBN online data bank.

c) Interest Rate: Interest rate is measured as lending rate of banks, using average lending rate in each month, which is sourced from the CBN online data bank.

d) GDP: The Gross Domestic Product is measured as the monetary value of goods and services produced in a country. The data is monthly one, which is sourced from the CBN online data bank.

e) Average Rainfall: This is measured as the average rainfall in the country per month. The data is monthly one, which is sourced from the CBN online data bank.

f) Money Supply: This deals with the volume of money in circulation which include currency in circulation, demand and fixed deposits in banks. The data are monthly data that are sourced from the CBN online data bank. All the data are monthly time series data, which span from January, 2006 to December, 2020.

Presentation and Analysis of Results

This section covers discussion on descriptive statistics and trend analysis. It also discusses the unit root and co-integration tests, which is followed by presentation of estimates from the regression equations.

4.1 Descriptive and Trend Analysis

The descriptive statistics in Table 4.1 is employed to describe the characteristics of the data. All the series are monthly data that span between January, 2006 and December, 2020. The summary statistics include mean, median, maximum, minimum, standard deviation (std. dev.), coefficient of variation (CoV) and number of observation (Obs), which are respectively reported in Columns two, three, four, five, six, seven and of the table. The first column is for the list of the variables in the study. The descriptive statistics of the variables are discussed, following the presentation.

4.1 Descriptive Statistics of Variables Employed

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	CoV.	Obs.
HLINF	11.2842	11.3400	18.7200	3.0000	3.2935	0.2919	180
RMSTGDP	3.8541	3.6150	9.4000	0.7000	1.8230	0.4730	180
INT	16.5098	16.6950	19.6600	11.3100	1.5353	0.0930	180
ARF	5098.2960	5096.1650	5454.9650	4509.0140	154.3880	0.0303	180
CINF	10.0334	10.9800	14.0000	0.6000	2.9472	0.2937	180
FINF	12.1969	12.7950	20.9000	-3.7000	4.8082	0.3942	180
GDP	4129746.0	4087323.0	4938290.0	3197595.0	430817.7	0.1043	180
CEXCHR	0.6460	0.0000	27.1013	-3.3263	3.0366	4.7005	180

Explanatory notes: Std. dev.= standard deviation; CoV. = coefficient of Variation with observation (t) = 180 for all the variables in the table which begins from January, 2006 to December, 2020. The exchange rate is expressed as change in nominal exchange rate. ***Source:Author's computation (2022).***

As shown in Table 4.1, the mean and median of headline inflation (HLINF) are 11.2842 and 11.3400 respectively, while the maximum and minimum values are 18.7200 and 3.0000 respectively, which are found in January, 2017 and January 2006 with standard deviation of 3.2935. In the case of ratio of money supply to GDP, the mean and median are 3.8541 and 3.6150 respectively, while the maximum and minimum values of

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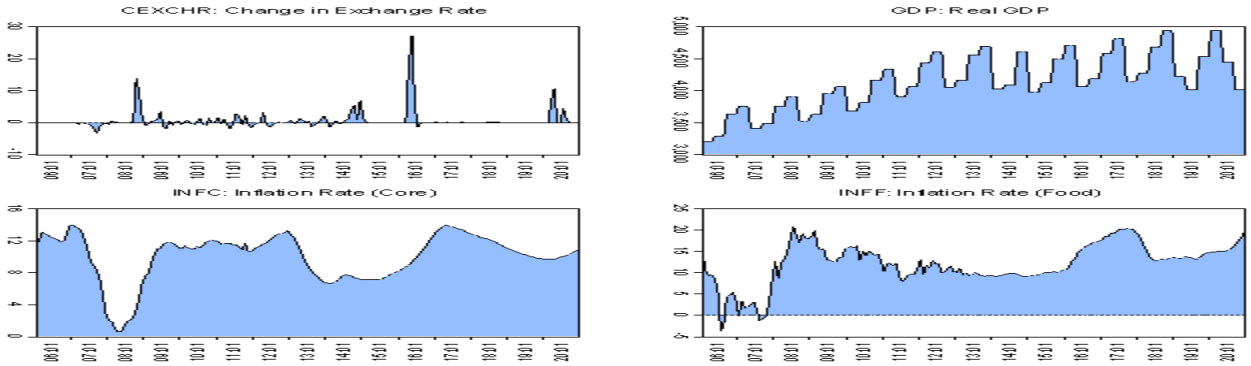
9.4000 and 0.7000 respectively, which are found in December, 2020 and February, 2006 with standard deviation of 1.8230. Considering, interest rate (INT), the mean is 16.5098 with median of 16.6950. The maximum value is 19.6600 with minimum value of 11.3100, which can be found in November, 2009 and October, 2020 with standard deviation of 1.5353. Also, the mean and median of average rainfall (ARF) are 5098.2690 and 5096.1650 respectively, while the maximum and minimum values are 5454.9650 and 4509.0140 respectively, which can be found in December, 2020 and January 2006, with standard deviation of 154.3880. Also, the mean and median of core inflation (CINF) are 10.0334 and 10.9800 respectively, while the maximum and minimum values are 14.0000 and 0.6000 respectively, which are found in January, 2007 and April, 2008 with standard deviation of 2.9472. In the case of food inflation, the mean and median are 12.1969 and 12.7950 respectively, with the maximum and minimum values of 20.900 and -3.7000 respectively, which are found in July, 2008 and July, 2006 with standard deviation of 4.8082. Considering, Gross Domestic Product (GDP), the mean is 4129746.0 with median of 4087323.0. The maximum value is 4938290.0 with minimum value of 3197595.0, which can be found in February, 2020 and January, 2006 with standard deviation of 430817.7. In addition, the mean and median of change in exchange rate (CEXCHR) are 0.6460 and 0.0000 respectively, while the maximum and minimum values are 27.1013 and -3.3263 respectively, which are found in May, 2016 and September, 2007 with standard deviation of 3.0366.

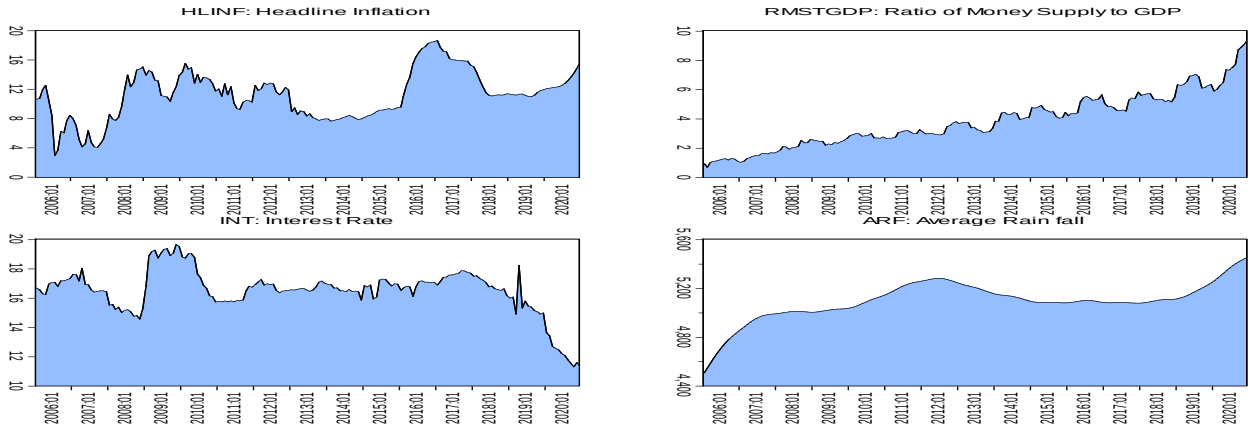
Figure 4.1 Trend of Change in Exchange Rate (CEXCHR), GDP, Core Inflation (CINF) and Food Inflation (FINF)



Explanatory Note: the horizontal axis measures the months the changes in the variables occur. Change in exchange rate rate (CEXCHR), Gross Domestic Product (GDP), core inflation (INFC) and food inflation (INFF) are measured along the vertical axis.

From Figure 4.1 above, the trend of change in nominal exchange rate exhibits oscillation between negative and positive axis, showing a zigzag shape while GDP exhibits a zigzag shape as well. The shape of core inflation shows that it fluctuates right from 2006 till the end of 2020, with a relatively stable shape towards the end of 2020. Also, it is revealed in the figure that food inflation rate oscillates throughout its entire live. It was negative in late 2006 and 2007.

Figure 4.2: Trend of Headline Inflation, (HLINF), Ratio of Money Supply to GDP (RMSTGDP), Interest Rate (INT) and Average Rainfall (ARF)



Explanatory Note: the horizontal axis measures the periods the changes in the variables occur. Headline inflation rate (HLINF), ratio of money supply to GDP (RMSTGDP), interest rate (INT) and average rain fall (ARF) are measured along the vertical axis.

From Figure 4.2, it is revealed that headline inflation (HLINF) moves upward and downward throughout the entire periods, while ratio of money supply to GDP (RMSTGDP) slope positively right with some levels of fluctuations from January, 2006, which is the beginning period, till December, 2020, which is the end period. Also, the figure shows that interest rate (INT) maintain a zigzag movement from the starting point till the end, while the figure reveals that average rainfall's movement is positive and look like mountain, with little fluctuations.

4.1.1 Unit Root Test

In order to find out the time series property of the variables employed and to avoid spurious results from the regression estimates, the study carried out stationary test to. This is done to know whether the series are stationary at levels, order 1 and order 2. A series will be adjudged to be stationary at level (I(0)) or at first difference (I(1)) if the probability value is less than 0.05 significance level. The results of Dickey-Fuller test for the variables employed in the study are presented as below.

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Var./Prob. Values	P-Value at	P-Value at 1st	Order of
CINF (Core inflation rate)	0.3464	0.0334	I(1)
HLINF (Headline Inflation rate)	0.2822	0.0000	I(1)
FINF (Food Inflation rate)	0.7111	0.0200	I(1)
CEXCHR (change in nominal	0.0000	-	I(0)
INT (interest rate)	0.4282	0.0000	I(1)
ARF (Average rainfall)	0.7819	0.0901	I(1)
GDP (Real Gross Domestic	0.3919	0.0000	I(1)
RMSTGDP (Ratio of money supply to GDP)	0.2822	0.0000	I(1)

Table4.2: Results of Dickey-Fuller Unit Root Test for the Variables Employed in the Study

The following are the meaning of acronyms for the variables in Table 4.2:CINF is the core inflation, HLINF is the headline inflation, FINF is denoted as food inflation, while CEXCHR is denoted as changes in exchange rate. INT represents interest rate, while ARF means average rain fall, GDP implies real GDP and RMSTGDP implies ratio of money supply to GDP. All the series span from 2006M01 – 2020M012, I(0) and I(1)mean stationary at order 0 and 1 respectively.The probability valueof order of integration is in the second and third columns. A variable is considered stationary when the probability value is statistically significant at 5%.

Source:Author's computation (2022).

It is shown in Table 4.2 above that the p-value for all the series, except CEXCHR, at levels are not statistically significant, which means that they are not all stationary at levels, except change in exchange rate (CEXCHR). Also, it is revealed that the p-value of all the series are statistically significant at first difference, which implies that all the series are stationary at first difference or integrated of order 1.

4.1.2 Co-integration Test

In order to test whether long run relationship exist among the series in each of the three models, co-integration test is carried out, using ARDL Bound Test. The choice of ARDL Bound Test is born out of its suitability for the series that are stationary at different orders. The ARDL Bound Tests results are as presented below in Table 4.3.

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Table 4.3: Results of ARDL-Bound Test for FINF, CINF and HLINF Models

MODELS	F-statistics	5% Sig	Remarks
FINF: Food Inflation	1.7913	I_0 = 2.22 I_1 =3.39	Not Co-integrated
CINF: Core Inflation	1.5446	I_0 = 2.22 I_1 =3.39	Not Co-integrated
HLINF: Headline Inflation	1.6335	I_0 = 2.22 I_1 =3.39	Not Co-integrated

The following are the meaning of acronyms for the variabls in Table 4.3: FINF is denoted as food inflation, CINF is the core inflation while HLINF is the headline inflation. All the series span from 2006M01 – 2020M012, I_0 and I_1mean lower bound and upper bound critical value respectively. A model is adjudged to be co-integrated, if F-statistics is greater than the upper bound critical value at 5% significance level and not co-integrated, if F-statistics is less than upper bound critical value.

Source:Author's computation (2022).

As shown in Table 4.3 above, the F-statistics of FINF, CINF and HLINF models are 1.7913, 1.5446 and 1.6335, which are less than upper bound critical value at 5% significance level. This implies that all the models, based on decision rule, are not co-integrated. Therefore, the suitable estimation technique is short-run non-linear-ARDL.

4.2 Regression Estimates

This sub-section discusses the parameter estimates of the three models, which include CINF, FINF and HLINF models. The estimation technique employed is short-run non-linear ARDL. Nonlinear ARDL is employed to determine the asymetrics impact or effect of exchange rate on inflation. The short-run regression equation estimates for Core inflation, Food inflation and Headline inflation are presents as below,

4.4: Regression Equations Estimates for Core, Food and Headline Inflation

	CINF			**FINF**			**HLINF**			
Variables	**Coeff**	**t-Stat**	**P-value**	**Coeff**	**t-Stat**	**P-value**	**Coeff**	**t-Stat**	**P-value**	**VIF**
D(CINF(-1))	0.6939	13.3211	0.0000	-	-	-	-	-	-	-
D(INFHL(-1))	-	-	-	-	-	-	0.1232	1.5817	0.1156	
D(CEXCHR_POS)	0.0147	1.0992	0.2733	0.0144	3.5122	0.0009	0.0408	2.6441	0.0020	9.0000
D(CEXCHR_POS(-1))	-0.0734	-2.2801	0.0239	-	-	-	-	-	-	-
D(CEXCHR_NEG)	0.0447	1.4541	0.1478	0.0338	0.8196	0.4136	0.0493	1.9841	0.0489	-
D(INT)	0.0444	1.4329	0.1538	-0.0842	-0.6735	0.5016	-0.0410	-0.5366	0.5922	4.8000
D(ARF)	0.0080	1.5892	0.1139	-0.0389	-2.3726	0.0188	-0.0142	-1.4171	0.1583	9.0000
D(GDP)	0.0000	-0.9903	0.3235	0.0000	0.7088	0.4794	0.0000	0.2149	0.8301	2.0000
D(RMSTGDP)	-0.0960	-1.0118	0.3131	0.4689	1.2457	0.2146	0.2157	0.9253	0.3561	1.9000
ect(-1)	-0.0447	-3.1019	0.0023	-0.0883	-3.0172	0.0029	-0.0524	-1.9291	0.0554	-
S/Corr.	5.4611	-	0.1213	0.7920	-	0.4546	1.1704	-	0.1852	-
Hetero.	3.5455	-	0.3001	3.6580	-	0.2002	3.4521	-	0.1004	-
J/Bera	6.6511	-	0.2001	5.2561	-	0.1211	2.9140	-	0.2132	-
Ramsey/R	1.6954		0.1950	3.4438		0.0652	1.6200		0.2049	

Explanatory Note: CINF is core inflation, FINF is food inflation, HLINF is headline inflation, CEXCHR is change in exchange rate, INT is interest rate, ARF is average rainfall, GDP is gross domestic product, RMSTGDP is ratio of money supply to GDP, ect is error correction term, S/Corr. is serial correlation test Hetero. Is heteroscedasticity test, J/Bera is Jaque Bere statistics and Ramsey/R is Remsey Reset Statistics. The p-values attached to each coefficient is in the column next to t-statistics, which is denoted as t-stat. A coefficient is adjudged to be statistically significant in the study if its p-value is not more than 0.05 significance level.

Source: Author's computation (2022).

4.2.1 Diagnostic Tests

a) Serial Correlation: It is shown from the table that F-statistics in CINF, FINF and HLINF models are 5.4611, 0.7920 and 1.1704 respectively with p-values of 0.1213, 0.4546 and 0.1852. Since the p-values are more than 0.05 significance level, the null hypothesis of no serial correlation cannot be rejected in the three models. Therefore, the models are not suffering from the problem of serial correlation.

b) Heteroscedasticity: It is shown from Table 4.4 that F-statistics in CINF, FINF and HLINF models are 3.5455, 3.6580 and 3.4521 respectively with p-values of 0.3001, 0.2002 and 0.1004. Since the p-values are more than 0.05 significance level, the null hypothesis of no heteroscedasticity cannot be rejected in the three models. Therefore, the models are not suffering from the problem of heteroscedasticity or unequal variance

c) Normality in the Distribution of Residuals: As shown in Table 4.4, the Jaque-Bera value of CINF, FINF and HLINF are 6.6511, 5.2561 and 2.9140 respectively with p-values of 0.2001, 0.1211 and 0.2132. Since the p-values are greater than 0.05 significance level, the null hypothesis of

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normality in the distribution of residuals cannot be rejected. Therefore, the models are not suffering from the problem non-normality of residuals.

d) Multicollinearity: It is reveled from Table 4.4 that Variance Inflation Factor (VIF) for CEXCHR, INT, ARF, GDP and RMSTGDP are 9.00, 4.80, 9.00, 2.00 and 1.90 respectively. Since no explanatory variable has VIF that is equal or greater than ten, the models do not have the problem of multicollinearity among their explanatory variables.

e) Model Misspecification: It is shown in Table 4.4, the Ramsey F-statistics for CINF, FINF and HLINF are 16954, 3.4438 and 1.6200 respectively with p-values of 0.1950, 0.0652 and 0.2049. Since the p-values are greater than 0.05 significance level, the null hypothesis of no misspecification error cannot be rejected. So, the models are not suffering from model misspecification errors.

Discussion of Results

From Table 4.4, it is shown that the coefficient of lag1 of INF is 0.6939 with p-value of 0.0000, which implies that the coefficient is positive and statistically significant at 5% significance level. It means that expected inflation has positive impact on inflation, especially core inflation in Nigeria. Also, it is revealed from the table that the coefficient of lag1 of headline inflation is 0.1232 with p-value of 0.1156, which implies that the coefficient is positive and statistically insignificant.

It is shown in Table 4.4 that the coefficients of POS_CEXCHR in CINF, FINF and HLINF models are 0.0147, 0.0144 and 0.0408 respectively, with p-value of 0.2733, 0.0009 and 0.0020. This implies that the coefficient of POS_CEXCHR is positive and statistically significant in FINF and HLINF models. Based on preponderance of evidence, it can be inferred that positive change in exchange rate will bring about positive change in inflation rate, especially food inflation and headline inflation in the short-run. This is in line with theory and apriori expectation. The finding also follows the study such as Osabuohien et al. (2018).

Also, it is shown in the table that the coefficients of NEG_CEXCHR in CINF, FINF and HLINF models are 0.0447, 0.0338 and 0.0493 respectively, with p-value of 0.1478, 0.4136 and 0.0489. This implies that the coefficient of NEG_CEXCHR is positive and statistically significant in only HLINF model. It can be inferred that negative change in exchange rate will bring about negative change in inflation rate, especially headline inflation in the short-run. This is not in line with theory and apriori expectation as no theory has made proposition that explain how negative change in exchange rate brings about any change in inflation, whether negatively or positively.

It is also revealed in Table 4.4 that the coefficients of INT in CINF, FINF and HLINF models are 0.0444, -0.0842 and -0.0410 respectively with p-value of 0.1538, 0.5016 and 0.5922. This implies that the coefficients of INT are statistically insignificant. So, based on the want of evidence, it can be inferred that interest rate

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has no impact on inflation rate in the short-run.

It is also shown in the table that the coefficients of ARF in CINF, FINF and HLINF models are 0.0080, -0.0389 and -0.0142 respectively, with p-value of 0.1139, 0.0188 and 0.1583. This means that the coefficient of ARF is negative and statistically significant at 5% significance level in only FINF model, while its coefficient are not statistically significant in CINF and HLINF. Based on balance of evidence, it can be inferred that rainfall has negative impact on inflation, especially food inflation. This is in line with apriori expectation and it is in line with previous study such as Sani et al. (2020).

In addition, it is shown in the table that the coefficients of GDP, in the short-run, in CINF, FINF and HLINF models are 0.0000, 0.0000 and 0.0000 respectively, with p-value of 0.3235, 0.4794 and 0.8301 This implies that the coefficients of GDP, though small, is positive but not statistically significant in all the models. It can be inferred that GDP does not have impact on inflation rate in Nigeria in the short-run. This is in line with theory and apriori expectation.

Table 4.4 also shows that the coefficients of RMSTGDP in CINF, FINF and HLINF models are -0.0960, 0.4689 and 0.2146 respectively with p-value of 0.3131, 0.2146 and 0.3561. This implies that the coefficients of RMSTGDP is positive but not statistically significant. It can be inferred that RMSTGDP does not have impact on inflation rate in Nigeria in the short-run. This is in line with theory and apriori expectation.

Summary, Conclusion and Recommendation

This section covers summary, which is discussed in Sub-section 5.1, conclusion, which is discussed in Section 5.2 and recommendation of the study which is discussed in Sub-section 5.3.

5.1 Summary

Exchange rate play a vital role in any economy, which include international trade and general economic performance. Exchange rate determines a number of macroeconomic variables such as inflation. It affects the entire aspects of the economy of any nation, ranging from household spending, investment of businesses, unemployment rate, tax policies, interest rate etc. Because of the nature of inflation in any economy, authority needs to put in place some policy measures to always control it in order to avoid distortions in the economy. Before the authority could put in place policies to curb inflation, they need to be well guided by studies that will give them insights on the various economic variables that could influence inflation rate. To this end, a number of studies have been carried out to bring to bear the impact of exchange rate on inflation rate in Nigeria. For this study to make contribution to the stock of knowledge in this area, it poised to examine the asymmetric and non-asymmetric impact of exchange rate on inflation.

In order to know the level of research efforts in this area and draw the research gap, the

study carry out literature review, which covers theoretical and empirical review. The theory reviewed include Phillips Curve, Keynesian Theory of Inflation, Monetary Theory of Inflation, New Keynesian Phillips Curve (NKPC). A number of empirical studies were reviewed such as Egwaikhide, Chete and Falokun (1994), Nogueira (2007), Abubakar, Apeh and Nweze (2021), Ude and Anochie (2014), Charles and Chilaka (2019), to mention but a few. After the empirical review of literature, research gap was drawn.

In order to choose a suitable methodology for the study, the theoretical framework was put in place, which serves as a precursor for model specification in the study. Various estimation techniques employed in the study were discussed including trend and descriptive analysis, unit root tests and co-integration test, non-linear ARDL and diagnostic tests.

In a bid to bring to bear the findings of the study, the results was presented and discussed. The descriptive statistics results was presented to show the summary statistics of the series in the study, along with the presentation of trend analysis of the series. The results of pre and post-estimation tests were discussed, with that of non-linear ARDL regression.

5.2 Conclusion

Based on the findings of the study, the following are the conclusion of the study.

Expected inflation or lag of inflation has positive impact on inflation in the short-run in Nigeria.

Exchange rate has symmetric impact on inflation rate in the short-run in Nigeria. It has positive impact on FINF and HLINF in the short-run.

The impact of rainfall on inflation rate is negative in the short-run in Nigeria.

5.3 Recommendation

The study recommends that authority should put in place exchange rate and price harmonization institution that will ensure that exchange rate pass-through occurs at the time when Naira appreciates and depreciates. This is to control the producers from charging excessive prices, especially when the cost of production has fallen due to appreciation of Naira.

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Effects of Information Communication Technology on the Operational Performance of Selected Examination Bodies in Nigeria

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Abstract

The use of information communication technology devices has been widely adopted by national examination bodies in Nigeria to enhance their efficiency and improve the credibility of the results of their examination over the last few years. This study therefore examines the effects of the use information communication technology on the operational performance of selected examination bodies in Nigeria. The selected examination bodies are National Examination Council (NECO) and Joint Admission and matriculation Board (JAMB). In this study, quantitative research method is used. The primary data use in this study was collected through questionnaire distributed to the staff of the selected examination bodies. The data collected from the respondents was analysed using SPSS and SMART PL S software for the exploratory and confirmatory factor analysis respectively. The results of the study show that the examination bodies in Nigeria have embrace the use of ICT. Also, the use of ICT for on-line registration has reduced the cumbersomeness in examination registration procedure in Nigeria examination bodies and the adoption of ICT has helpful effect on the performance of the examination bodies.

Keywords: Information Communication Technology, Operational Performance, Operational Time Cycle, Examination Bodies

1.0 Introduction

Examination bodies are saddled with the responsibility of conducting public examinations in which results or certificates could be awarded with varying categorization. The results could inform selection and placement depending on the vision and the mission of the examination body (Okechukwu, 2014). In Nigeria, the national examination conducting bodies include National Examinations Council (NECO), National Business and Technical Examinations Board (NABTEB) and National Board for Arabic and Islamic Studies (NBAIS) and Joint Admissions and Matriculation Board (JAMB). Each of these examination bodies is given specific mandates upon which their performance is assessed (Federal Ministry of Education, 2019).

As public organizations, the performance of the examination bodies is usuallymeasured in operational form, which is seen in the efficiency and effectiveness of achieving the organizational goals (Roge & Lennon, 2018; Fourie &Poggenpoel, 2017).Some of the goals that examination bodies are set to achieve include ease of candidates' registration, seamless examination conduct and timely release of examination results.The

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availability of relevant human and materials resources is germane to the achievement of these goals. The conduct of examination involves various stages starting from the registration of candidates to the processing and final release of results. In other to achieve the mandate for which they are established, the examination bodies utilize human and material resources at the various stages of the examination process. Information and communication technology (ICT) plays vital roles at the different stages of the examinations process, leading to reduction in operational cycle time thereby enhancing operational efficiency of examination bodies.

In this twenty-first century, one of the key resources needed to boost the operational performance of any organization is information and communication technology (ICT). ICT is employed by institutions to ease inquiry, save time, and improve service delivery (Alu, 2002). ICT has been adopted in the Nigerian educational industry for various purposes ranging from teaching, learning, research, examination and lots more (Aworanti, 2016; Adegbija, Fakomogbon and Daramola, 2012; Kwacha, 2007). Over the last one-decade, national examination bodies in Nigeria have deployed various ICT devices to enhance their efficiency and improve the credibility of the results of their examination. The deployment of ICT in the examination process is meant to resolve some challenges associated with registration of candidates, conduct of examination and processing of results through the introduction of online registration, e-examination, data capturing machine, digital processing of result and online checking of results.

This study, therefore, aimed at examining the effects of the use of information and communication technology in the operational performance of two national examination bodies (NECO and JAMB) in Nigeria. The study will particularly assess the extent to which the use of computer and information processing devices affects examination registration, conduct of examination and processing of results in the selected examination bodies.

Over the years, examination conducting bodies have been confronted with lots of challenges due to the large number of candidates sitting for public examinations and the need for timely release of results. In the past, some of the processes involved in the conduct of examination are either done manually or with little involvement of information technology devices. This is responsible for issues such as inability to resolve problems associated with registration of candidates for examinations, difficulty in validation of candidate data, omission in processing of results and delay in release of examination results (Okolie, Nwosu, Eneje& Oluka, 2019).

However, to reduce operational time cycle and enhance efficiency, the examination conducting bodies has introduced different ICT innovations in their mode of operations. Many of their activities that are manually done are now being done online through the use of information and communication technology. The deployment of this

technology come with huge cost and is not completely free from challenges. Unstable electricity supply, shortage of skilled manpower and poor network can sometimes limit the efficiency of the ICT devices (Aworanti, 2016; Agbada, 2008).

In view of the above stated problems, this study assesses the extent to which the use of computer and information processing devices has affects the operational performance of examination bodies in Nigeria.

2.1 Conceptual Review

2.1.1 Operational Performance

Generally, the concept of performance is viewed as the achievement of an organization in relation to the set objectives. Enhancing the effective performance of agencies of government is a major concern and interest of any public administration (Asencio, 2016). Hence, from the public sector perspective, organizational performance is the ability of an agency to discharge its operational and administrative functions well in order to actualize its mission (Al Khajeh, 2018).

In literature, scholars posit that the performance of the public sector in terms of efficiency and effectiveness is important in fulfilling their responsibility to serve the general public (Parhizgari& Gilbert, 2004). The assessment of organizational performance has been viewed by Luo, Huang and Wang (2012)from two perspectives comprising of financial performance and operational performance. According to them, financial performance can be viewed from business-oriented organizations where the performance is evaluated based on profitability, returns on investment, growth in the market share, maximization of owners' wealth among others. However, operational performance is the operational aspect where performance can be evaluated on the basis of observable outcome. In other words, operational performance can be qualitatively measured through; product and service delivery, customer and client satisfaction and employee satisfaction (Simon, Bartle, Stockport, Smith, Klobas &Sohal, 2015; Oztekin et al.,2015). Otheroperational elements employed in measuring the effectiveness and efficiency of organizational performance and service delivery include; operational time target and operational efficiency (Ramadan &Borgonovi, 2015).

2.1.2 Information Communication Technology

The concept of information is considered as being fundamental to the well-being of any contemporary organization (Safa, Von Solms & Futcher, 2016),and it can be seen as a basic commodity without which many organizations cannot effectively operate (Hwang, Kim, Kim & Kim, 2017; Van Niekerk& Von Solms, 2010). Information and Communication Technology comprises a wide range of applications, communication, and technologies used in information retrieval, research communication and administration (Scott, 2002 sited by Agbetuyi & Oluwatayo (2012)). Thus, ICT plays vital role in the development and performance of organizations (Kong *et al.*, 2015; Kong, Kim & Kim, 2012; Soomro, Shah & Ahmed, 2016). ICT has become so crucial that all spheres of lives of people and organizations

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are affected in one way or the other (Van Niekerk, & Von Solms, 2010).

2.1.3 Examination Bodies in Nigeria

Examination bodies are educational institutions established to determine and gauge the educational quality of students moving from one specific level to another. They are entrusted with certification and advisory/selection functions (Okechukwu, 2014). Some of the examination bodies in Nigeria are; WAEC, NABTEB, NECO, JAMB, NTI and COREN. This study is limited to JAMB and NECO because the activities of the bodies serve as a link between the secondary and tertiary education.

2.1.3.1National Examinations Council (NECO)

NECO was established byadecree promulgated in April 1999 by the former military head of state General Abdusalami Abubakar and legislated into law in the National Assembly in Act 2 of 2002, cited in the Law of the Federation CAP N37 of 2004. Upon the establishment, NECO was mandated to take over the responsibilities of National Board for Educational Measurement (NBEM) and to conduct the following examinations (NECO, 2004): National Common Entrance Examinations (NCEE) for Unity Colleges and other Federal Government Colleges, Junior School Certificate Examination now Basic Education Certificate Examination (BECE), Senior School Certificate Examination (SSCE) Internal, Senior School Certificate Examination (SSCE)external, and any other examination as directed by the Federal Ministry of Education

The core value of NECO is to redefine the future of Nigerian child through quality assessment with the vision to become major player in the global assessment industry (NECO, 2014). Also, NECO has a mission to deliver examinations whose results are trusted worldwide for their credibility (NECO, 2017).

2.1.3.2 Joint Admissions and Matriculation Board (JAMB)

JAMB was established by an Act in 1978. The Board is vested with the power to conduct examination and ensure that competent students are admitted into tertiary institutions in Nigeria (Danladi & Dodo, 2019).

The Act of 1978 was subsequently amended in 1989 and in 1993 the board was empowered to conduct Matriculation Examination for entry into all Universities, Polytechnics and Colleges of Education in Nigeria and place suitably qualified candidates in the tertiary institutions (JAMB, 2020; Federal Ministry of Education, 2019).

2.2 Theoretical Framework

In this study, Technology Acceptance Model is reviewed.

The Technology Acceptance Model (TAM) is an information systems theory that models how users come to accept and use a technology. It was developed byDavis and Richard Bagozzi (Davis 1989, Bagozzi, Davis & Warshaw 1992).The model suggests that when users are presented with a new

technology, a number of factors influence their decision about how and when they will use it. Perceived usefulness (PU) and Perceived ease-of-use (PEOU) are two major factors that have direct influence on technology acceptance model. PU is defined by Fred Davis as "the degree to which a person believes that using a particular system would enhance his or her job performance". It means whether or not someone perceives that technology to be useful for what they want to do. Likewise, Davis (1989) defined PEOU as "the degree to which a person believes that using a particular system would be effortless". If the technology is easy to use, then the barriers conquered. However, if it's not easy to use the interface is complicated and no one has a positive attitude towards it.

In general, TAM focuses on the individual 'user' of a computer, with the concept of 'perceived usefulness', with extension to bring in more and more factors to explain how a user 'perceives' 'usefulness'. The TAM ignores the essentially social processes of information system development and implementation and the social consequences of information system use.

2.3 Empirical Review

Many identified studies on organizational performance in Nigeria are tailored towards financial performance of non-governmental organization (Balogun, 2016; Abubakar, Nasir & Haruna, 2011).Besides, some of the available studies on operational performance of public organization in Nigerian are not in the aspect of the examination conducting bodies (Diugwu et al., 2019; Pius et al., 2017; Sutia et al., 2013).Some of the studies on the effects of information and communication technology on the performance of both public and private organization are reviewed below.

Diugwu et al., (2019) assessed the impact of ICT on the Nigerian banking industry using eleven selected commercial banks in Nigeria and discovered that the use of ICT in the banking industry increases return on equity. Also, Balogun (2016), examined customer's and employee's responses to technology innovation, and their effects on the performance of the Nigerian banks. His findings revealed that technological innovation influenced banks employee's performance, customer's satisfaction and improvement in banks profitability. The deployment of ICT in the banking sector has transformed it operations from the traditional to presumably better ways with technological innovation, resulting in improves efficiency. This has perhaps increased the bank level of ICT usage over the years (Ovia, 2005).

Baba &Odiba, (2015) examined the effects of ICT on Nigerian educational system with a focus on Kogi State University, Anyigba. The result of the study revealed that lack of ICT professional, resources, infrastructure and management support affects effective teaching and learning and research development in Nigerian schools. In similar study, Aworanti, (2016) examined the challenges of ICT deployment in the educational assessment industry and found that, the major challenges of ICT in Nigeria educational assessment system includes: poor computer literacy level among students and teachers, dearth of ICT skilled personnel,

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inadequate ICT infrastructures and lack of fund.

A thorough search of the available literature reveals a dearth of study on the effect of ICT on operational performance of examination bodies in Nigeria. Therefore, this study intends to examine the effect of ICT on operational performance national examination bodies in Nigeria. National examination bodies are selected because they provide an important service to large numbers of Nigerian students.

2.7 Research Gap

Several studies in the field of public organization have taken interest in the area of organizational performance. The indication from the central review of literature shows that to date, most of the studies on the effects of information and communication technology on organization performance are mostly tailored to organization financial performance in the private business settings such as banks, industries, hotel businesses and SMEs. However, a critical review of literature indicates a dearth of empirical studies relating to effects of information and communication technology on operational performance of the examination conducting bodies in Nigeria. This study, therefore, seeks to provide insight on the effects of information and communication technology on operational performance of national examination bodies in Nigeria.

3.0 Methodology

In this study, quantitative research method is used. The survey research design was employed to find out the views of NECO and JAMB staff on effect of ICT on operational performance of their organization. The primary data use in this study was collected through questionnaires. The questionnaire is sub-divided into two sections. Section A gives information on the demographic data of the respondents. Section B of the questionnaire consists of fifteen items. Each item contains four options in the form of Likert-scale: Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD). Statistical package SPSS and SMART PLS software were used for the analysis of the data collected.

The population of this study comprises of the headquarter staff of selected departments (ICT, Accounts and Examination Administration) in the chosen examination bodies as shown in the Table 1.

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Table 1: Population of the Study

Examination Bodies	ICT Department	Accounts Department	Examination Administration Department	Total
NECO	75	43	85	203
JAMB	81	47	73	201
TOTAL	156	90	158	404

Source: Author's Field Survey 2021

The sample size of this study is determined using the Taro Yamane (1967) formula as follows:

$$n = \frac{N}{1-Ne^2} = \frac{404}{1-4040.10^2} \approx 80 \text{ .....Eqn 1}$$

Where 'n' is sample size, 'N' is population size and 'e' is the level of significance. The level of significance for the study is set at 10% and the population size is four hundred and four staff of the three departments of the two examination bodies.

The proportionate stratified sampling technique is used to determine the number of staff to include in this study from each department. This is achieved by using the equation 2.

$$n_{sd} = \frac{N_{sd}}{N} \times n \text{ ..... Eqn 2}$$

Where 'n_{sd}' is the sample size of the department, 'Nsd' is the population size of the department 'd', n is sample size for this study (80) and N is the population size for this study (404). The resulting sample is seen in the Table 2.

Table 2: Study's Sample Size

Examination Bodies	ICT Department	Accounts Department	Examination Administration Department	Total
NECO	15	9	17	41
JAMB	16	9	14	39
TOTAL	31	18	31	80

3.1 Model Specification

The dependent variable is operational performance while the independent variable is ICT. The dependent variable, operation time cycle (OTC) is proxy for operational performance while the components of the independent variable include resources, capabilities and support. .

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This is expressed as shown below:

OTC = f (ICT)……..... Eqn (3)

Specifying it in econometric form, we will have:

OTC = f (Resources, Capabilities, Support)

OTC = f (RSS, CPL, SPT)

$OTC = \beta_0 + \beta_1 RSS + \beta_2 CPL + \beta_3 SPT + e_i$……..... Eqn (4)

Where:

OTC = Operational Time Cycle

β = Constant

β_i - β_3 = Coefficient of independent variable

RSS = Resources

CPL= Capabilities

SPT = Support

e_i = Error term which represents other factors outside the model

4.0 Presentation and Interpretation of Result

The data collected from the respondents was analysed using SPSS and SMART PLS software for the exploratory and confirmatory factor analysis respectively. Details of the result are further presented in the following subsections.

4.1 Reliability of the measurement instrument

To obtain the overall reliability of the research data, the Cronbach's Alpha measure of reliability was computed. The result, as shown in Table 3, revealed that the obtained reliability is statistically significant at a value of 0.829. Ideally, a reliability value greater than 0.7 is considered statistically significant, which implies that the scale used in the measurement items can satisfactorily provide a metric for the measurement item.

Table 3: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items
.829	.862	21

4.2: Path Analysis

As stated in the expression in Equation 4, the overall operation time cycle is a regression problem, which requires a path analysis of the contributing factors. By computing the path analysis using SMART PLS, the overall regression weight of each factor as well as each item on the respective factor, can be achieved. The result of the path modelling is shown in Figure 1. A statistically significantly regression weight of 0.478 was obtained for the OTP construct. A synthesis of the result is further explained.

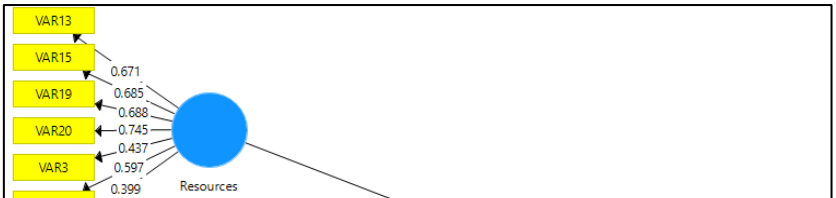

Figure 1: Path Analysis of the Study

The analysis details the reliability and the validity of both the construct and the scale. Table 4 shows the construct reliability and validity matrix computed from the regression model. Factors and constructs are used interchangeably to mean the same thing in this context. First, from the reliability of each construct, it was observed that both capabilities and support fell below the standard requirement. However, the OTP and Resources construct adequately satisfied the reliability requirement. However, the average variance extracted (AVE) for each construct fell below the standard 0.5 benchmark. The AVE is a metrics used to measure the degree of variance exhibited by a construct, relative to the variance of random measurement error. An AVE ≥0.5 is considered a measure of the convergent validity of the construct.

Moreover, the composite reliability (CR) shows an internal consistency in the summed scale for each construct. A CR value ≥0.7 is implied to truly reflect the internal consistency of the construct. As shown in the Table 4, the CR for all the constructs is above the acceptable threshold, except the Capability construct. In terms of the discriminant validity, as shown in Table 5, Capability shows a clear distinction when compared to the other constructs, as it has a relatively higher correlation with itself at 0.623. Similarly, the OTC exhibited a clear discrimination with other constructs with a self-correlation value of 0.694. However, the converse was recorded for the Resources and Support constructs. There was a higher correlation between Resource and OTP at value of 0.664, which is greater than 0.616 self-correlation. Similar, a higher correlation was observed between Support and Resource

construct at 0.664, in contrast to the 0.616 self-correlation, obtained for the Resource construct. A visual illustration of these result is further presented in Appendix ZZZ, where the RED colour indicates a below standard observation and a GREEN depicts a satisfactory result.

Table 4: Construct reliability and validity matrix

	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
CAP	0.227	0.652	0.388
OTP	0.719	0.817	0.481
RSC	0.724	0.804	0.38
SUPP	0.651	0.77	0.377

Table 5: Discriminant validity

	CAP	OTP	RSC	SUPP
CAP	0.623			
OTP	0.468	0.694		
RSC	0.471	0.664	0.616	
SUPP	0.532	0.545	0.664	0.614

The respondents answer to the questionnaires is collated and the percentage of the responses from the 79 respondents collected was presented in Table 6. The results show a strong agreement to the use and positive effects of ICT on the performance of the examination bodies in Nigeria. Specifically, more than 90% of the respondents agree to the use and positive effects of ICT on the performance of the examination bodies except for the use of E-examination as indicated in questions 8 and 10 with 63.3% and 86.6% level of agreement. This result is in agreement with Agbetuyi and Oluwatayo (2012) who stated that the use of on-line registration (ICT) has reduced the cumbersomeness in examination registration procedure in Nigeria examination bodies. Also, it can be inferred from the result that the examination bodies in Nigeria has embrace the use of ICT and the adoption of ICT has helpful effect on the performance of the examination bodies.

Table 6: Percentage of responses obtained from the questionnaires

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S/N	Statement	Strongly Agree (SA) %	Agree (A) %	Disagree (D) %	Strongly Disagree (SD) %	Not Applicable (NA) %
1	ICT makes candidates/clients payment procedure faster	65.8	34.2	0.0	0.0	0.0
2	Registration of candidates are done online through ICT	70.9	26.6	0.0	0.0	2.5
3	Biometric capturing of candidates is enhance by ICT	79.7	19.0	1.3	0.0	0.0
4	Validation of candidates data is done online through ICT	67.1	29.1	1.3	0.0	2.5
5	Online registration saves time in collating students' data	63.3	36.7	0.0	0.0	0.0
6	Biometric capturing of candidates reduces impersonation	79.7	16.5	3.8	0.0	0.0
7	Online validation reduces error in candidates' data	36.7	57.0	6.3	0.0	0.0
8	E-examination has been adopted in my organization	43.0	20.3	15.2	6.3	15.2
9	E- examination reduces malpractice cases	48.1	43.0	8.9	0.0	0.0
10	E- examination reduces time of processing of results	49.4	39.2	11.4	0.0	0.0
11	ICT enhances the processing and timely release of results	67.1	32.9	0.0	0.0	0.0
12	ICT enhances E-Confirmation and Verification of Results	67.1	32.9	0.0	0.0	0.0
13	On-line results" checking is made available through ICT	75.9	24.1	0.0	0.0	0.0

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14	On-line support services is made available through ICT	59.5	39.2	1.3	0.0	0.0
15	Processing and Payment of staff claims is enhanced by ICT	46.8	46.8	5.1	0.0	1.3
16	ICT enhances operational efficiency of my organization	55.7	44.3	0.0	0.0	0.0
17	ICT makes accounts preparation faster	55.7	43.0	1.3	0.0	0.0
18	ICT makes reconciliation of accounts easier	48.1	49.4	1.3	0.0	1.3
19	Availability of resources enhance proper implementation of ICT	54.4	45.6	0.0	0.0	0.0
20	Competencies and Capabilities of Staff promotes ICT innovations	64.6	35.4	0.0	0.0	0.0
21	ICT adoption is enhanced by strong management /executive support	62.0	38.0	0.0	0.0	0.0

5.0 Conclusion

The effect of information and communication technology (ICT) on operational performance of examination bodies has been examined in this study. The findings of this study as obtained from the two selected examination bodies can be summarised as follows:

The use of ICT is adopted at various stages of the examination process stating from candidates' registration to the checking of results.

To a large extent, the use of computer and information processing devices affects examination registration, conduct of examination and processing of results in the selected examination bodies.

The adoption of ICT has positive effect on the organisational performance of the examination bodies in Nigeria.

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