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Central Bank of Nigeria and the Developmental Function: Some Thoughts on Policy Measurement Perceptions.



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Abstract

The developmental function is one prominent contribution of the Central Bank of Nigeria to the Nigerian economy. Routine reporting of this function focuses on volume of projects funded, disbursements, and repayments. Exploring the possibility of expanding the reporting scope, this paper conceptualized and illustrated handy measures of policy anchored on macroeconomic aggregates, to track this function relative to other macroeconomic policy ends. Descriptive and inferential analyses suggested that the financial, economic and market intensity measures were quite responsive to developments in the economy and could be useful tools for policy reporting purposes. The pricing intensity indicator suggested distortions in the pricing mechanism. It is recommended that the pricing of the interventions receive some look-in by the Bank while the indicators should, still, be interpreted with caution.

JEL Classification: E51, E58

Keywords: central bank; macroeconomic policy; development finance; developmental function; quantitative easing.

1.0 Introduction

Like most other central banks, the primary mandate of the Central Bank of Nigeria (CBN) is to ensure monetary and price stability. This primacy is shared by four other objectives, namely: issuing legal tender currency in Nigeria; maintaining external reserves to safeguard the international value of the legal tender currency; promoting a sound financial system; and acting as banker and providing economic and financial advice to the Federal Government. In addition, the Bank has been ascribed numerous secondary mandates, complementary to the core ones, including banking, treasury, and credit operations; liquidity management; developmental function; and payment and settlement systems facilitation, among others.

Of research interest here is the developmental function which, without a doubt, is among the prominent contributions of the CBN to the economy. A similar function has increasingly been undertaken by other central banks, including those in advanced economies. For instance, in April 2020, the United States' Federal Reserves introduced the Mainstreet Lending Program, a US\$600 billion credit intervention for small and medium-sized businesses that were financially sound before the COVID-19 pandemic. With US\$75 billion co-funding from the US Treasury, the programme effectively ran from July 2020 to January 2021, providing 1,830 loans valued at US\$17.5 billion to 2,453 borrowers (Bräuning and Paligoro, 2021; Kolakowski, 2021).

In another instance, the Bank of England (BoE's) Funding for Lending Scheme (FLS), initiated in 2012, allowed banks and building societies to borrow at lower rates from it for a maximum of four years and increase lending to households and businesses (Department for Business, Innovation and Skills, 2013). In 2016, it introduced the Term Funding Scheme (TFS), a four-year funding facility at interest rates close to the Bank's Base Rate plus a fee, to participating financial institutions. Reviews indicated that the Scheme effectively lowered the mortgage lending rates (Ginelli Nardi et al, 2018;

Meertens, 2019). The counter-COVID-19 interventions of the BoE included the Term Funding Scheme with Additional Incentives for Small to Mid-size Enterprises (TFSME) and the COVID Corporate Financing Facility (CCFF) which was introduced jointly with Her Majesty's Treasury (BoE, 2020; Mulreany, 2020).

The developmental function of the CBN gathered momentum immediately after the global financial crisis (GFC) of 2007-09, when quantitative easing became an inviting policy instrument for central banks. As a result, the Bank's development financing programmes rose markedly from one in 2009 to about twenty-four before the onset of the coronavirus pandemic in late 2019. Performance in this function is routinely reported by volume of projects funded, disbursements repayments, job creation, as well as capacity utilization, output, and efficiency improvements in funded enterprises. This limits an appreciation of the great depth of work under this function, leaving no room for perception of its effect on other policy ends and overall outcomes of the Bank's work.

Noting the issues of timeliness and representativeness around qualitative performance data on the interventions, and considering that the developmental function heavily leans on the macroeconomic policy transmission mechanism usually with lags in outcomes, how can reporting of this function be enhanced to provide more insights given timely available data? In other words, can we capture how the developmental function weighs into certain aspects of macroeconomic performance, and can this provide signalling for policy decision-making?

In this paper, we explore the possibility of enhancing the reporting of the developmental function using handy policy indicators or measures anchored on macroeconomic aggregates, to further track this function. Handy because of the consistent and reliable availability of data to construct the measures. We conceptualize these

indicators on the broad assumption that the Bank's multifarious development financing programmes for micro, small and medium enterprises (MSMEs) have a dual policy focus of addressing capital availability (credit rationing) and affordability (high interest rates charged by financial institutions). To take things beyond anecdotal arguments, we illustrate practical usefulness of these measures with available data.

From this point forward, the structure of the paper is as follows: Section Two presents the proposed policy measures and their theoretical motivations. Section Three focuses on methodology for deriving them while, in Section Four, we illustrate their application with real life data. Conclusion and recommendations are in Section Five.

2.0 Conceptual Issues

In proposing new measures of policy for the developmental function, the intention is to, directly, connect it to macroeconomic performance. These measures can be understood as some sort of intervention intensity measures quantifying the extent to which the intervention policies contributed to macroeconomic outcomes. As a policy tool, this can be useful in signalling to policy makers the size and direction of further intervention, if required, by giving hints about both policy and the economy. Accordingly, we propose four measures, namely, financial intensity, economic intensity, market intensity and pricing intensity. For each intensity measure, the ultimate question would be what the optimum levels or thresholds should be.

2.1 Financial Intensity

This is an internal measure of the effect of interventions on the balance sheet of the central bank itself. It is broadly defined as the ratio of cumulative intervention disbursements to total liabilities of the CBN. The formula is:

$$\text{Financial Intensity of Intervention} = \frac{\text{Cumulative intervention disbursements}}{\text{Total liabilities of the CBN}}$$

(2.1)

Since assets equal liabilities in general, this measure is as good as being the ratio of cumulative intervention disbursements to total assets of the CBN. In effect, this indicator

measures the implications of the Bank's development finance intervention policy instrument on the balance sheet as a monetary policy instrument.

The central bank balance sheet is a convenient monetary policy tool for financial system stability, especially in periods of financial distress. In considering balance sheet policies, emphasis has been on quantitative easing, credit easing, emergency lending assistance, changes in the supply of bank reserves and targeted asset purchases (Curdia and Woodford, 2010; Caruana 2012; and Ademuyiwa et al, 2018).

For Nigeria, Kure et al (2019) found evidence of the central bank balance sheet as a monetary policy tool. They concluded that while the CBN could, in the short- to medium-term, sustain its intervention programmes on the economy, the programmes would be more effective when the Bank became more of a banker's bank than when it is a government's bank, as the latter crowded out private sector growth.

In this context, scaling the intervention disbursements along this line alludes to the size of the balance sheet as crucial for intervention policy. In turn, it traces the implications of the real sector interventions on the balance sheet. A significant trend coefficient for this measure would situate the direction of evolution of this measure as increasing, decreasing or stable.

Growth in the ratio connotes expansionary monetary policy due to quantitative easing effects while a decline means it is contractionary. A positive correlation of intervention disbursements with total liabilities would imply co-movement, where both go in the same direction. The Granger-causality test would determine the precedence between them, that is, which of the two predicts the other.

2.2 Economic Intensity

This is a measure of the contribution of interventions to aggregate national output or national income. It is defined as annual

intervention disbursements proportionate to annual nominal gross domestic product (GDP), that is:

$$\text{Economic Intensity of Intervention} = \frac{\text{Annual intervention disbursements}}{\text{Annual nominal gross domestic product}}$$

(2.2)

Intervention fund disbursements are credit facilities. In the classical production function, these are capital inputs in the production of the associated output, given their contribution to current assets (raw materials and inventories) and fixed assets (capital goods, also capital formation).

This measure is motivated by the domestic credit-to-GDP ratio, that is, private sector credit to the economy as a proportion of GDP. Private sector credit has been shown to promote economic growth (Olowofeso et al, 2015; Amoo et al, 2017). The World Bank describes domestic credit as financial resources provided to the private sector by other depository corporations except central banks, and includes loans, purchases of non-equity securities, trade credits and other accounts receivable that create a claim for repayment. In some countries, it may include credit to public enterprises.

In this context, intervention disbursements are credits from the CBN to the private sector. Scaling the disbursements by the GDP is a representation of the intensity of the interventions on the economy. How would the economy respond to this portion of credit to it? Significant trend, positive correlation and Granger-causality analyses of this measure would have a similar interpretation as in the financial intensity measure. More importantly, positive or increasing relationships would imply a boosting of growth while negative or decreasing mean otherwise.

2.3 Market Intensity

This is a measure of the level of "complementarity" or "substitution" of the credit market by the intervention funds. It sets cumulative intervention disbursements as a ratio of domestic credit (loans and advances) to the economy.

$$\text{Market Intensity of Intervention} = \frac{\text{Cumulative intervention disbursements}}{\text{Domestic credit to the economy}}$$

CBN's credit to the real sector of the economy could have a complementary effect to domestic credit which is, largely, obtained from other depository corporations. Positive correlation means complementarity and stimulation of private investment. On the other hand, it could be substitutionary, in which case there is a displacement effect on private financial institutions' funding to the economy, something like crowding it out.

2.4 Pricing Intensity

This is a measure of the (percentage points) difference between:

(I) the market prevailing market rates, precisely the prime lending rate, and the intervention lending rate, which we will call the "intervention spread", calculated as:

$$r = \frac{\sum (x - \bar{x}) (y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2 \sum (y - \bar{y})^2}}$$

(3.1)

where

- χ = Observations for intervention variable
- γ = Observations for macroeconomic aggregate variable
- $\bar{\chi}$ = Mean of intervention variable
- $\bar{\gamma}$ = Mean of macroeconomic aggregate variable

The null hypothesis was a one-tailed test of Υ not being greater than zero or positive, against the alternative that it was positive. The one-tailed test is statistically more powerful than the two-tailed and was apt for purpose because both variables were hypothesized to increase or decrease correspondingly, that is, the relationship was aptly considered in one (positive) direction. Some authors suggested, as a general guide, that if

$\pm 0.1 \leq \Upsilon \leq \pm 0.3$, Υ is small $\pm 3.1 \leq \Upsilon \leq \pm 5.0$, medium; and $\pm 5.1 \leq \Upsilon \leq \pm 1.0$ large large (see Schober et al, 2018; Birkett, 2019; Kent State University, 2021).

Granger-causality to determine causation in the relationship between the intervention and the macroeconomic aggregate variables.

Granger-causality is about information content, temporal relations and precedence, not about cause-and-effect relationship in the usual, ordinary understanding of it. A variable χ Granger-causes another variable γ if it helps to predict or forecast it. In this sense, it is possible to have bi-directional causality, where each variable predicts the other (Granger and Newbold, 1977; Hamilton, 1994; Eichler, 2013; Ashley and Tsang, 2014; Öhman and Yazdanfar, 2017; Maitra, 2019). The motivation of Ganger-causality is to determine if lagged values of χ would improve the explanation of current γ when added to past values of γ . That is,

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \dots + \alpha_1 y_{t-i} + \beta_1 x_{t-1} + \dots + \beta_1 x_{t-i} + \epsilon_t$$

$$x_t = \alpha_0 + \alpha_1 x_{t-1} + \dots + \alpha_1 x_{t-i} + \beta_1 y_{t-1} + \dots + \beta_1 y_{t-i} + \mu_t$$

(3.2)

where:

y_t, x_t = Current values of y and x

α_0 = Constant term

$\alpha_1, \dots, \alpha_i$ = Coefficients of lagged values of y and x from the 1st to i th lag

y_{t-1}, \dots, y_{t-i} = 1st to i th lagged values of y

x_{t-1}, \dots, x_{t-i} = 1st to i th lagged values of x

β_1, \dots, β_i = 1st to i th Coefficient of y and x in the relevant equation

ϵ_t, μ_t = Error terms in the relevant equation

The tests were conducted at two lags as permitted by the size of the samples. The null hypothesis that all the β coefficients in each equation were jointly equal to zero was tested by the Wald F-statistics. This is to say that:

$$\beta_1 = \beta_2 = \dots = \beta_i = 0 \dots$$

(3.3)

1) Scaling of relevant intervention variable by the relevant macroeconomic aggregate variable, to derive a ratio time series. The ratios are as defined in (2.1), (2.2) and (2.3). For the balance sheet and credit to the economy ratios, the relevant intervention variable was the cumulative disbursements while for the GDP, it was the annual disbursements.

2) Trend analysis to determine the existence of a linear trend in the ratio series. The function analyzed was the bivariate relationship of the time trend and the relevant

ratio. It is given as:

$$\gamma_t = \beta_0 + \beta_1 \text{ trend} + e_t$$

(3.4)

where:

Y_t = Dependent variable being relevant ratio variable

b_0 = Constant or intercept term

b_1 = Coefficient of the trend term

trend = Trend variables (values from 1 to n , the last period in the series

e_t = Error term

The null hypothesis of no trend was tested by the significance of the b_1 coefficient. For the rate variables, analysis proceeded as follows:

1) Determine the interest rate differential between the intervention fund interest rate and weighted prime lending rate, and the real intervention fund rate being the difference between the intervention interest rate and the inflation rate, as in (2.4) and (2.5).

2) Graphical analysis of the spread and the real intervention rate.

3) t-test of difference between means to determine whether the intervention spread and the real intervention rate were significant percentage differences that justified the interventions. The independent t-test assuming unequal variance was applied because, although the two samples were of the same size (number of observations), their variances were assumed to be unequal as they were drawn from different populations. It is given as:

$$t = \frac{X_1 - X_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

(3.5)

t = statistic

\bar{X}_1 = Mean of the first sample

\bar{X}_2 = Mean of the second sample

s_1 = Standard of the first sample

s_2 = Standard of the second sample

n_1 = Sample size of the first sample

n_2 = Sample size of the second sample

The null hypothesis was that the difference between the two population means equalled zero, that is, $\mu_1 - \mu_2 = 0$ or $\mu_1 = \mu_2$, and the test statistic was evaluated against the t-test distribution table values (Bevans, 2020).

4) Trend analysis to determine the existence of a linear trend in the rate differentials and real rate series. The function analyzed was a bivariate relationship of the type in (3.4) except that the dependent variable was the spread or the real rate. The same test of hypothesis applied.

4.0 Results and Discussion

Table 4.1 presents the data. Intervention disbursements are aggregate disbursements from existing interventions at any point in time. Disbursements from the Agribusiness/ Small and Medium Enterprises Investment Scheme (AGSMEIS) and the Creative Industry Financing Initiative (CIFI) were excluded from the study since these programmes were not funded from the CBN's balance sheet. Domestic credit is the sum of commercial and microfinance banks' loans and advances.

Table 4.1: Intervention and Macroeconomic Data

Year	Intervention Disbursements		CBN Liabilities	Domestic Credit	Nominal GDP	Rate		
	Annual	Cumulative				Intervention	Prime Lending	Inflation
2010	288.45	304.34	8,767.69	7,706.48	54,612.26	9.00	17.59	13.80
2011	232.47	536.81	16,750.71	7,312.78	62,980.40	9.00	16.02	10.90
2012	100.56	637.37	20,680.45	8,150.12	71,713.94	9.00	16.79	12.20
2013	106.70	722.40	15,062.62	10,005.69	80,092.56	9.00	16.72	8.50
2014	120.25	866.19	14,583.36	12,889.53	89,043.62	9.00	16.55	8.00
2015	249.98	1,088.57	16,492.27	13,086.39	94,144.96	9.00	16.85	9.00
2016	253.12	1,326.93	24,738.62	16,117.40	101,489.49	9.00	16.87	15.60
2017	401.49	1,700.11	33,944.93	15,740.79	113,711.63	9.00	17.58	16.50
2018	1,033.93	2,733.95	40,673.93	15,417.68	127,736.83	9.00	16.72	12.10

Sources: CBN Annual Report (various years); CBN Statistical Bulletin 2019; National Bureau of Statistics. N/B: All monetary values are in Nbillion and rate values in per cent.

Annual aggregate disbursements declined in 2012 but steadily increased from 2013. The quantum leap in 2018 was a result of significant increase in disbursements in the Anchor Borrowers' Programme (ABP) and the Nigerian Bulk Electricity Trading - Payment Assurance Facility (NBET-PAF), as well as the introduction of six programmes, viz, Shared Agent Network Expansion Facility (SANEF); CBN-BOI Industrial Facility (CBIF); Non-Oil Export Stimulation Facility (NESF); Export Development Facility (EDF); and the Real Sector Support Facility using Differentiated Cash Reserve Ratio (RSSF-DCRR).

Total liabilities of the CBN increased from 2010 to 2012, declined for two consecutive years, and had been on the increase since 2015. Domestic credit and nominal GDP increased throughout the review period while there were movements in both directions in sub-samples for prime lending and the inflation rates. The prime lending rate is

usually the lowest of the market lending rates, hence its choice as reference for this study.

4.1 Financial Intensity

The Pearson correlation coefficient between the cumulative intervention disbursements and the total liabilities of the CBN was +0.93, suggesting extremely high association and co-movement. This was expected because the interventions were quantitative easing instruments that should result in balance sheet expansion, other factors held constant. In their absence or reduction, liabilities should reduce.

However, Granger-causality test for the adjusted sample size of 7 observations (Table 4.2) indicated no precedence between the variables as the probabilities were at 17.67 and 11.23 per cent, respectively. These were higher than the permissible 5 per cent test level of significance set for the null hypothesis test.

Table 4.2: Granger-causality Test Results for Financial Intensity Measure

Null Hypothesis	Obs	F-Statistic	Prob.
Total liabilities do not "predict" cumulative disbursements	7	4.6603	0.1767
Cumulative disbursements do not "predict" total liabilities		7.9015	0.1123

Source: Authors' calculations

That the CBN's balance sheet size does not predict the disbursement profile in its real sector interventions and vice versa suggested that, although both moved in the same direction, they had stronger determinants other than each other. Furthermore, the

evolution of the measure showed its lowest at 3.1 per cent and highest at 6.7 per cent. This small contribution of interventions to the balance sheet growth and the narrow range could partly explain the non-prediction (Figure 4.1).

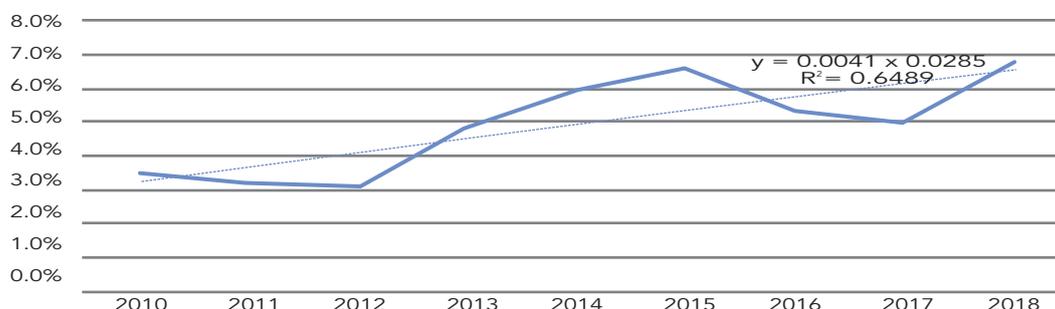


Figure 4.1: Financial Intensity of the Developmental Function

Clearly, the introduction of the ABP in 2015, and the combined effect of introduction of numerous interventions and huge leaps in ABP and NBET-PAF disbursements in 2018,

raised the intervention profile relative to the balance sheet, as the highest intensities were registered in both years. Practically, more of the Bank's resources were used in those years compared to other years.

The trend analysis returned a significant trend coefficient of 0.0041, with the F-statistic value

of 12.94 and probability of less than 0.88 per cent (Table 4.3).

Constant	Trend coefficient	F-statistic	Prob.	R2	Adjusted R2
0.0285	0.0041***	12.9395	0.0088	0.6489	0.7548

Source: Authors' calculations. N/B: *** is significance at 1 per cent.

This implied an upward or increasing trend of intervention with respect to the utilization of the balance sheet. Hence, to a reasonable extent, the financial measure is useful for tracking intervention effects on the balance sheet policies of the Bank.

4.2 Economic Intensity

With a Pearson correlation coefficient of +0.68, the relationship between the annual

intervention disbursements and the GDP could be described as robust. They changed correspondingly. In Table 4.4, the Granger-causality test rejected the null hypothesis of no prediction from nominal GDP to annual disbursements, the probability being 2.3 per cent given the significant F-statistic of 42.3. The reverse null hypothesis of prediction from intervention disbursements to GDP could not be rejected.

Table 4.4: Granger-causality Test Results for Economic Intensity Measure

Null Hypothesis	Obs	F-Statistic	Prob.
Nominal GDP does not "predict" annual disbursements	7	42.3072**	0.0231
Annual disbursements do not "predict" nominal GDP		1.3272	0.4297

Source: Authors' calculations. N/B: ** is significance at 5 per cent, respectively.

This interesting result suggested that current and past levels of national income or aggregate output provided feedback which policymakers at the CBN often responded to,

in formulating the real sector financing interventions. This is empirically informative as it confirmed that intervention policies were guided by developments in the economy through analytical thought processes.

A temporal graph of the economic measure showed its lowest and highest intensities at 0.13 and 0.81 per cent, respectively, in 2013 and 2018.

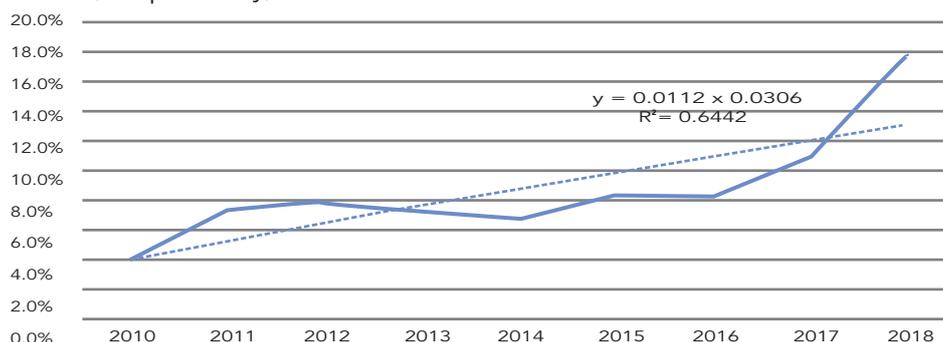


Figure 4.3: Market Intensity of the Developmental Function

With stability beginning to return after the GFC, the 2010-2011 period saw declining intensity of intervention relative to GDP. Between 2012 and 2014, intensity was stable. However, the economic recession of 2016/17 attracted increased intervention funding evidently intended to reflate the economy

and was responsible for the increased intensity of interventions from that time. In particular, the Bank pursued improvement in domestic supply of rice, fish, sugar, and wheat, four commodities which were estimated to have a combined import bill of about ₦1.3 trillion annually (CBN, 2019).

Table 4.5 did not indicate the existence of a trend in the measure, further confirming the

dominance of cycles, business/economic cycle effects, over the trend effects.

Table 4.5: Trend Analysis of the Economic Intensity Measure

Constant	Trend coefficient	F-statistic	Prob.	R2	Adjusted R2
0.0021	0.0002	0.6593	0.4435	0.0861	-0.0445

Source: Authors' calculations.

This outcome suggested that the measure would be useful for reporting on the developmental function.

Other results suggested no causality in the predictive sense, either way (Table 4.6). That is, there was neither inference that current and prior intervention disbursements increased domestic credit, nor did CBN's current and previous intervention funding motivate private sector lending. Could it be that the intervention policies were not being effectively transmitted through the private financial institutions? Where does the intervention funding go? Who gets it? The results still gave some clues to answer these questions.

4.3 Market Intensity

The strength of association between cumulative intervention disbursements and domestic credit was a sizeable +0.79. That connoted a complementary, non-disruptive relationship. Of course, the entire volume of intervention disbursements gets directly funnelled into the quantum of credit provided domestically. So, this co-movement was expected.

Table 4.6: Granger-causality Test Results for Market Intensity Measure

Null Hypothesis	Obs	F-Statistic	Prob.
Domestic credit does not "predict" annual disbursements	7	1.1653	0.4618
Annual disbursements do not "predict" domestic credit		5.8466	0.1461

Source: Authors' calculations

It was believed that, when the level of domestic credit to certain sectors, such as agriculture, was below optimum for growth, the CBN tended to intervene through financing options to support those sectors. That implied additional credit to the economy based on prior information about the level of domestic credit. This would increase the intensity measure, keeping private sector credit, which constituted the highest proportion of domestic credit, constant. By this thinking, the results should have indicated that current and past levels of domestic credit predicted current CBN's intervention funding. That the results suggested otherwise demand further examination.

of enterprises. Their loans to small-scale enterprises (the SMEs) as a percentage of their total loans for the study period, was lowest at 0.07 per cent in 2016 and 2017 – in the thick of the recession! – and highest at 0.29 per cent in quarter four of 2018 (CBN, 2019b). If data were separately available for micro enterprises, this proportion would even be lower, given their poor attraction to commercial banks.

Now, CBN's interventions mostly focused on MSMEs. On the other hand, commercial banks, from where the bulk of domestic credit emanates, did not focus on these categories

So, the intensity measure just confirmed that CBN's interventions stayed true to course, providing increased access to finance for underserved and unserved MSMEs, while private sector credit continued to target other economic units (e.g., large enterprises and government) but MSMEs. This market segmentation, possibly, explained the co-movement without Granger causality and, also, why there was no substitutive relationship between both aggregates.

Market intensity of intervention rose from 4.0 per cent in 2010 to 18.0 per cent in 2018, as in Figure 4.3, hinting at increasing importance of the Bank's interventions in the credit

market. The rapid increase from 2016 to 2018 was in line with implementation of counter-recession initiatives for this period.

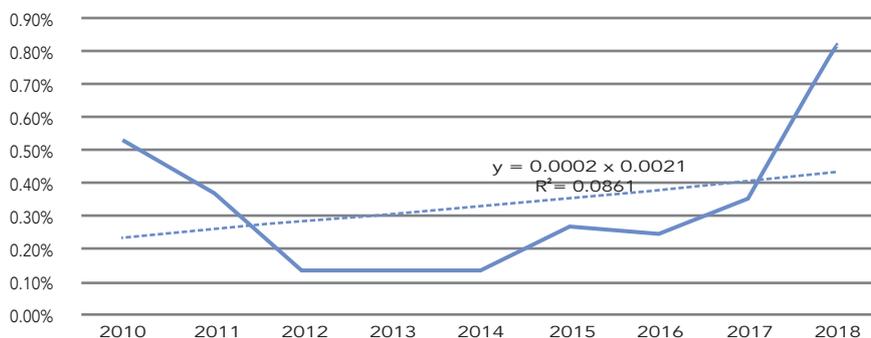


Figure 4.2: Economic Intensity of the Developmental Function

There was a significant positive trend in market intensity, as shown in Table 4.7, with F-statistic of 12.7 and level of significance of 0.92 per cent. This simply meant that although the two were increasing, intervention funding was rising faster than

private sector credit, implying that it drove the trend. Rapidly expanding intervention funding is indicative of an economy that was operating below optimum credit levels and urgently required stimulation which the quantitative easing policy afforded.

Table 4.7: Trend Analysis of the Market Intensity Measure

Constant	Trend coefficient	F-statistic	Prob.	R2	Adjusted R2
0.0306	0.0112***	12.6725	0.0092	0.6442	0.5933

Source: Authors' calculations. N/B: *** is significance at 1 per cent.

The market intervention intensity seemed a good measure of the developmental function as well, fairly tracking credit market developments relative to CBN's intervention funding.

intervention rate as defined in (2.4) and (2.5), respectively. As stated a priori, the variability in both was wholly due to variations in the market interest and the inflation rates since the intervention lending rate remained constant throughout the study period. This was a concerning reason whether this measure would be useful for policy decisions.

4.4 Pricing Intensity

Figure 4.4 shows the spread and the real

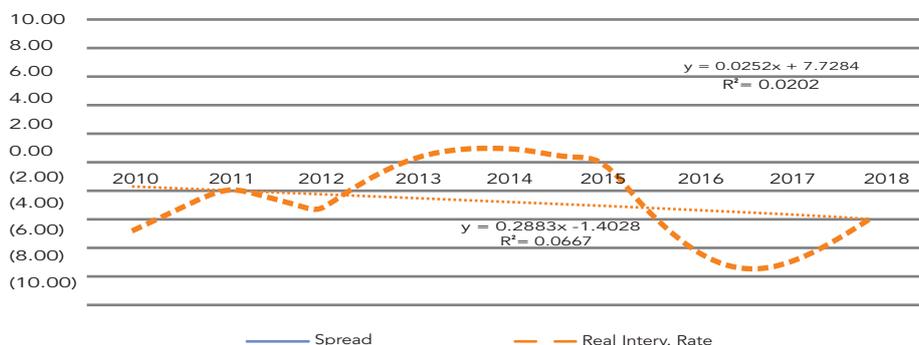


Figure 4.4: Pricing Intensity of the Developmental Function

Spread was all-positive and lowest in 2011 (7.02 per cent), a year after it was highest at 8.59 per cent. It was almost flat, with neither trend nor cyclical pattern observable. Real intervention rate was mostly negative. From

Table 4.8, we find no significant trends in the rates, although trend coefficients confirmed positive and negative developments in respective rates.

Table 4.8: Trend Analysis of the Financial Intensity Measure

Function	Constant	Trend coefficient	F-statistic	Prob.	R2	Adjusted R2
Spread	7.7284	0.0252	0.1439	0.7155	0.0202	-0.1198
Real Intervention Rate	-1.4028	-0.2883	0.5005	0.5021	0.0667	-0.0666

Source: Authors' calculations.

Analyses of the differences between the means by the t-test determined that they were significantly different from each other (Table 4.9). Note that the mean difference test between the intervention rate and the prime lending rate was a test of significance of the spread (Panel A) while that between the intervention rate and the inflation rate was a test for the real intervention rate (Panel B).

both the spread and the real intervention rate were much lower than or equal to 0.05. For the spread, test statistic was 48.59, which was larger than the critical one- and two-tailed statistics of about 1.86 and 2.31, resulting in probabilities of 1.80E-11 and 3.61E-11 per cent, respectively. These results indicated extremely high significant spread. The test statistic for the real rate was -2.79, with one- and two-tailed probabilities of 1.2 and 2.3 per cent, respectively.

Probabilities of either one- or two-tail tests for

Table 4.9: t-test of Differences Between Means

	Panel A		Panel B	
Difference	Spread		Real intervention rate	
Rate	Prime lending	Intervention	Intervention	Inflation
Mean	16.83	9.0	9.0	11.84
Variance	0.24	0	0	9.34
t Stat	48.5097***		-2.7917**	
Prob. (one-tail)	1.8040E-11		0.0117	
t Critical (one-tail)	1.8595			
Prob. (two-tail)	3.6080E-11		0.0234	
t Critical (two-tail)	2.3060			

Source: Authors' compilations. N/B: Observations = 9; degrees of freedom = 8; ** and *** are significance at 5 and 1 per cent, respectively.

Source: Authors' compilations. N/B: Observations = 9; degrees of freedom = 8; ** and *** are significance at 5 and 1 per cent, respectively.

Impliedly, the reduced cost of capital induced by the spread translated to significant reduction in cost of production for MSMEs. Borrowing from intervention funds, invariably, led to enhanced firm profitability. For financial institutions, the spread represented significant opportunity cost of capital forgone, even though the funds were similarly obtained at significantly discounted costs from the CBN. Their lower preference for the intervention funds for on-lending purposes was, therefore, not far-fetched. The institutions simply lent more from their own balance sheet to their target market recipients at competitive interest rates with wider spread which mirrored consumer price

developments, to rake in higher returns. Since the CBN kept expanding its interventions at the same time to its target end-users (MSMEs), this further explained why there was no substitutive relationship between CBN intervention funding and domestic credit.

From the real rate perspective, the implications were more straightforward. Fisher hypothesized that the real rate does not change much, and inflation expectations are matched by adjustments in the nominal rate. In this case, and contrary to the Fisher Effect, the nominal rate, which was the intervention rate, was fixed, leaving all changes traceable to inflation. This resulted in low and negative real intervention rate which, in effect, significantly disincentivized them to lend under the interventions. On the other hand, MSMEs were significantly incentivized to borrow because as inflation rose, they were

bound to repay effectively lower amounts in real terms.

It can be concluded that the pricing intensity measure aptly captured developments around prices.

5.0 Conclusion and Recommendations

We proposed and illustrated some new perspectives to reportage of the developmental function of the CBN. These are policy tracking measures steeped in relevant economic thoughts and anchored on macroeconomic aggregates, which we believe could provide further insights into the conduct of real sector intervention policy. They are financial, economic, market and pricing intensity measures, and were conceptualized on the assumption that the Bank's developmental function has a dual policy focus of addressing capital availability and affordability.

The financial intensity measure spoke to an accommodative stance between the CBN's balance sheet policies and its developmental function. The economic intensity measure exhibited potentials of being either a leading or lagging economic indicator because of its precise economic cycle tracking properties. The market intensity indicator suggested no distortionary effects of the interventions on the credit market size and seemed to confirm MSMEs as the major beneficiaries of CBN's interventions. The measure for pricing intensity showed significant distortions to the market pricing mechanism but highlighted the overwhelming importance of the interest rate policies for MSMEs. Overall, the

measures were generally responsive to developments in the macroeconomy, although they should be interpreted with caution.

Given the findings under the market intensity measure, it would be worthwhile to determine, with survey evidence, if the interventions mostly served the MSME market as intended. Moreover, it is recommended that the pricing aspect of the intervention policy receive another critical look-in by the Bank. Could the intervention rate be made inflation-adjustable? And, if so, is it possible to have a mix of interventions where each programme is driven by a single instrument rather than a combination? Providing wholesale funds for on-lending and simultaneously capping the intervention rate, in the same programme, makes it difficult to trace the origins of policy impact using the proposed indicators. The renewed emphasis on minimum loans-to-deposit ratio policy is analogous to this thinking and is in the right direction.

The Bank should consider pegging its intervention rate to its anchor rate, the monetary policy rate. This, again, has its drawback of being administratively- rather than market-determined. However, it shifts the goalposts a little wider for more participation by financial institutions in the interventions, by raising the real rate, reducing the unappealing spread, and freeing resources from the implicit subsidy in the intervention rate regime. In the circumstances, this would appear the Pareto optimal intervention interest rate.

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Asymmetric Trade Flows, Monetary Policy and Business Cycle Asynchronization Among ECOWAS Member Countries: Feasibility of ECOWAS Monetary Union Formation Beyond 2020



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Abstract

The formation of the West African Monetary Union which was initially slated for 2003 was postponed severally in 2005, 2009, 2015 and 2020. This raises the curiosity of investigating the possibility of its formation beyond 2020. It is against this backdrop that this paper investigated asymmetric trade flows, monetary policy and business cycle asynchronization among ECOWAS member countries: Feasibility of ECOWAS Monetary union formation beyond 2020. The objective was addressed using Pearson correlation analysis on computed z-scores and the seemingly unrelated regression estimation (SURE). The finding shows that the flow of trade within ECOWAS member countries were highly asymmetric indicating that these economies rely more on transaction with other developed economies. Therefore, the harmonization of the regional trade flow to enhance business cycle asynchronization that will transmit into common currency formation has not been achieved simultaneously by all ECOWAS member countries. Also, the findings revealed that it is difficult to achieve primary and secondary convergence criteria simultaneously among the West African Monetary

Zone (WAMZ) and West Africa Economic and Monetary Union (WAEMU) member countries. On this basis, the paper recommends that, countries that is highly symmetric under WAMZ like Nigeria, Ghana and Guinea and WAEMU like Burkina Faso-Mali, Cote d'Ivoire-Guinea Bissau, Cote d'Ivoire-Mali, Cote d'Ivoire-Senegal, Cote d'Ivoire-Togo, Guinea Bissau-Mali, Guinea Bissau-Senegal should form the West African Monetary Union beyond 2020 and subsequently others that meet the criteria can catch up.

Keywords: Asymmetric, Trade flows, monetary policy, Business cycle asynchronization, ECOWAS.

1.0 Introduction

Consequent upon the establishment of Economic Community of West African States (ECOWAS) in 1975, there have been sequence of efforts toward the creation of a West African monetary union. For the French speaking member countries, they have West Africa Economic and Monetary Union (WAEMU) created in 1994 comprising of seven (7) Francophone countries and Guinea Bissau (the only Portuguese speaking country). The WAEMU has a common central bank known as Banque Centrale des Etats de l'Afrique de l'Ouest (BCEAO) with a common currency known as West African CFA Franc tied to euro and guaranteed by the French treasury.

However, for English speaking member countries, the West African Monetary Zone (WAMZ) established in 2000 has numerous central banks with manifold currencies. For instance, Gambia uses (Gambian dalasi), Liberia (Liberian dollar), Nigeria (Nigerian naira), Sierra leone (Sierra Leonean leone), Ghana (Ghanaian cedi) whereas Guinea the only French speaking country under WAMZ uses Guinean franc (Sly & Weber, 2015).

ECOWAS has the main goal under article 3 sections 2e of 1991 of setting up a West African monetary union or common currency termed Eco. In order to realize this goal, the ECOWAS Heads of States adopted and ratified ECOWAS macroeconomic convergence criteria in 1999 (Baldwin & Wyplosz, 2009). These convergence criteria are made up of four (4) primary convergence

criteria and six (6) secondary convergence criteria. The primary criteria includes ratio of budget deficit to GDP excluding grants less than or equal to 4%, average annual inflation rate of less than or equal to 5%, central banking financing of budget deficit of less than or equal to 10% of previous year's tax revenue and Gross external reserve greater than or equal to 6 months of imports cover. The secondary criteria are prohibition of accumulation of new arrears and liquidation of the existing arrears, ratio of tax revenue to GDP greater than or equal to 20%, ratio of wage bill to tax revenue less than or equal to 35%, ratio of domestically financed public investment to tax revenue greater than or equal to 20%, positive real interest rate and real exchange rate stability of less than or equal to 5% (WAMZ & WAMU Macroeconomic Convergence Reports, 2011).

These criteria which are simply similarity target have remained the eligibility yardstick for ECOWAS member country's inclusion into the potential monetary union. However, they have been violated several times and have resulted in subsequent postponements of the commencement dates for the establishment of the monetary union (WAMZ & WAMU Macroeconomic Convergence Reports, 2011). As shown in appendix A, no ECOWAS member countries satisfied any of the four primary convergence criteria between 2001 and 2005 leading to the postponement of the commencement date of the monetary union to 2009. Between 2006 and 2008, Gambia and Nigeria satisfied all the four criteria. In 2009, only Liberia satisfied all the four criteria following her inclusion in to the WAMZ member countries. Subsequently, the commencement date for the monetary union was again postponed to 2015, and later to 2020. Following the non-achievements of the convergence criteria, there is need to therefore investigate further on the various levels attained so far in these similarities targets and examine if these levels could synchronize regional business cycles given that a sufficient degree of business cycles synchronization is a prerequisite for the

creation of a monetary union beyond 2020 (ADB Statistics Department, 2019).

However, while asymmetries in trade flows, business cycles and in macroeconomic policy coordination between WAMZ and WAEMU are the major obstacles towards the formation of common monetary union, they are highly under researched. For instance, real gross domestic product growth rate for both WAMZ and WAEMU between 2010, 2014, 2016, 2017 2018 and 2019 show wide disparities in business cycles synchronization. For Gambia it fluctuates from 6.53% to -0.22% to 2.21%, to 5.05% to 7.2% and down to 6.1% in 2010, 2014, 2016, 2017 2018 and 2019 respectively. Ghana fluctuates from 3.40% to 3.99% to 3.54% to 5.96% to 6.1% and 6.5% in 2010, 2014, 2016, 2017 2018 and 2019. Guinea fluctuates from 4.22% in 2010 to 3.70% in 2014, to 6.60% in 2016 to 6.37% in 2017 to 6.2% in 2018 and to 5.6% in 2019. Liberia fluctuates from 6.09% in 2010 to 0.69% in 2014, -1.64% in 2016 6.1% in 2019. Nigeria fluctuates from 10.60% in 2010, to 6.30% in 2014, to -1.50% in 2016 then to 0.77% in 2017 to -1.9% in 2019. Sierra Leone fluctuates from 5.35% in 2010, to 20.72% in 2013, to -20.49% in 2015 and to 5.79% in 2017 and to 5.5% in 2019 (IMF, International Financial Statistics and ADB Statistics Department, 2019).

For WAEMU member countries, the real gross domestic product growth between 2010, 2014, 2016 and 2019 are also dissimilar. For Benin it fluctuates from 2.11%, 6.35%, 3.96% and 6.9% respectively. Burkina Faso fluctuates from 8.45%, 4.33%, 5.95% to 5.7% in 2010, 2014, 2016 and 2019 respectively. Cote d'Ivoire stood at 2.41%, 8.50%, 8.34% and 6.2% respectively. That of Guinea-Bissau fluctuates from 4.41%, 0.96%, 5.74% and 4.7% respectively, while that of Mali fluctuates from 5.41% in 2010, -0.84% in 2012, 7.04% in 2014 and 5.48% in 2019. In the case of Niger the fluctuation in GDP growth was 8.36% in 2010, 7.53% in 2014, 5.04% in 2016 and 5.21% in 2019. That of Senegal stood at 4.18%, 4.31%, 6.65% and 5.3% respectively, while that of Togo stood at 4.02% in 2010, 5.87% in 2014, 5.04% in 2016

and 5.3% in 2019 (IMF, International Financial Statistics and ADB Statistics Department, 2019). These fluctuations in real GDP growth rate are indicative of not only non-synchronization of business cycles within ECOWAS Member Countries but also a formidable obstacle towards the formation of common monetary union.

Another important factor to be considered in the quest of common monetary union formation is the level of symmetry in trade flows. This is because asymmetry in trade flows may adversely affect macroeconomic policies (monetary, fiscal policies as well as exchange rates) and hold back business cycles synchronization (Bordo & Chang, 2011; Pundit, 2011; Grigoli, 2011; Juvenal & Montiero, 2012; Nzimande & Ngalawa, 2017). However, the various similarity targets of the ECOWAS macroeconomic convergence criteria were silent on regional trade but were seriously emphasized in the optimum currency area theory. The theory has it that countries within the same region must intensely trade with each other. On the contrary, the trade statistics from UNCTAD stat (2018) reveals that countries within ECOWAS region traded intensely with countries outside the region and minimally with countries within the region. Similarly, ECOWAS member countries import more goods and services than they export. This is evidenced by the overall deficit in the total trade balance in goods and services within West African states between 2005 and 2018 (AFDB, 2018). For example, statistics from Doing Business in ECOWAS (2018) reveals that Europe accounts for about 28% of ECOWAS exports with 23% for the European Union. America accounts for about 40%, Free Trade Association of North America accounts for about 34% and United States, Canada and Mexico account for about 24% with Nigeria and Cote d'Ivoire accounting for about 87% of these transactions (IMF, 2018). These disparities in trade flows offer clues of asymmetries in trade within West African states.

Furthermore, undue restrictions in currency

convertibility, production patterns as most ECOWAS Member countries only produce and export raw materials like crude oil and agricultural products to countries outside Africa and import finished goods from non ECOWAS member countries results in strong asymmetries in the level of trade flows, inhibiting the level of synchronization of business cycles within the sub - regions.

The exchange rate stability of less than or equal to 5% as stipulated in secondary criterion is still far from being achieved among WAMZ sub regions. For example, statistics from IMF (2018), International Financial Statistics (2018) and AFDB (2018) shows that between the periods 2012 and 2018 the WAMZ member countries had not fared well in exchange rate stability compared to the WAEMU member countries. Major reason for this poor exchange rate stability management is that eight currencies used in the 15 countries of the WAMZ member countries are not convertible and therefore cannot be freely exchanged for other currencies to foster better trade synchronization (Bakoup & Ndoye, 2016). Therefore the level of asymmetry in index of exchange rates within WAMZ could affect the synchronization of business cycles in West Africa.

Also, the gross external reserves as a proportion of 6 months of import for WAMZ and WAEMU show member countries experiencing dissimilarity trends. For example, while Gambia stands at 6.84 in 2013, 4.73 in 2014 and 3.82 in 2016, Ghana stands at 2.81 in 2013 and 2.65 in 2016. Similarly, Guinea stands at 0.79 in 2013, 1.21 in 2014 and 1.13 in 2016 while Liberia stands at 2.78 in 2013, 2.64 in 2014 and 2.55 in 2016. Nigeria stands at 7.06 in 2013, 5.09 in 2014 and 5.11 in 2016 and Sierra Leone stands at 2.82 in 2013, 2.51 in 2014 and 4.00 in 2016 (IMF, International Financial Statistics, 2018). For WAEMU member countries, while Benin stands at 3.22 in 2013, 2.89 in 2014, 0.34 in 2016, Burkina Faso is 1.59 in 2013, 0.82 in 2014 and 0.21 in 2016. Guinea-Bissau stands at 8.28 in 2013, 10.40 in 2014 and 0.65 in 2016, while that of Niger stands at 4.67 in

2013, 4.80 in 2014 and 0.32 in 2016. For Senegal, the gross external reserves in months of import is 3.70 in 2013, 3.37 in 2014 and 0.29 in 2016, while for Togo is 2.12 in 2013, 2.30 in 2014 and 0.37 in 2016. In the case of Mali, it is 2.96 in 2013, 1.89 in 2014 and 0.25 in 2016, while that of Cote d'Ivoire is 4.22 in 2013, 4.42 in 2014 and 0.36 in 2016 (IMF, International Financial Statistics, 2018). Therefore the probability that the required outcomes of ECOWAS macroeconomic convergence criteria are fundamental in the quest of creating a viable monetary union among the ECOWAS Member countries necessitates the need in analyzing the feasibility of this potential monetary union beyond 2020. Therefore, an inquiry into the feasibility of a monetary union in West Africa given the ECOWAS macroeconomic convergence criteria and the standards of the Optimum Currency Area (OCA) criteria is indeed inevitable.

These two criteria forms the basis of our incorporating the cyclical thrift scheme (CTS) where monetary contributions made by member countries for a particular purpose provides a forum for deep economic thinking. It is also worthy of note that both the ECOWAS macroeconomic convergence criteria and the optimum currency area criteria all bother on issues in similarity trade flows, similarity in macroeconomic policy and ultimately the synchronization of business cycles. This necessitates the need to investigate symmetric trade flows, monetary policy and business cycles synchronization among ECOWAS member countries and the level of preparedness for monetary union creation beyond 2020.

2.0 Theoretical Literature

This section discussed relevant theoretical frameworks developed by the growth theorists, in the study of link between trade flows, monetary policy and business cycle synchronization. These theories therefore, serves as a background for proper understanding of the asymmetric trade flows, monetary policy and Business cycle asynchronization among ECOWAS member

countries. Consequently, the theoretical frameworks upon which this paper is based are the Country similarity trade theory and Optimum Currency Area (OCA) theory.

i. Country similarity trade theory

This theory was developed by a Swedish economist Steffan Linder in 1961. The core of the theory is the concept of intra-industry trade. The theory has it that consumers in countries that are in the same or similar stage of development would have similar preferences. The theory, also has it that companies should first produce for domestic consumption and in exploring export, markets that are similar to the domestic one, in terms of customer preferences, offer the most potential for success. For the similarity theory, states that trade most in manufactured goods will be between countries with similar per capita incomes (i.e., synchronized business cycles), and intra-industry trade will be common. This theory is often most useful in understanding trade in goods where brand names and product reputations are important factors in the buyers' decision-making and purchasing processes.

ii. Optimum Currency Area (OCA) theory

Optimum Currency Area (OCA) was formulated by Mundell (1961) and McKinnon (1963). To the theory, the shift to generalized floating of the major currencies and European Monetary Union (EMU), which began in the early 1970s, generated practical interest in currency areas. This interest has continued to grow especially among the ECOWAS member countries. Therefore, optimum currency areas argues that the optimal area for a system of fixed exchange rates, or a common currency, is one that is highly economically integrated. That is production and exports are widely diversified and of similar structure between countries and are very open to trade with each other.

The theory also argues that countries must agree to compensate each other for adverse shocks as currency union member countries must share a wide consensus on the way to

deal with shocks and that when the common monetary policy gives rise to conflicts of national interests, the countries that form a currency area need to accept the costs in the name of a common destiny (Mundell, 1961; McKinnon, 1963; Baldwin & Wyplosz, 2009).

The theory also argued that the choice of exchange rate regime should depend on the size of the economy and its degree of openness. If the tradable sector characterizes the greater share in a small economy, the flexible exchange rate regime will be optimal to achieve external balance. In this case, the country should practice a proactive monetary policy to counteract the pass-through effect and attain internal price stability. On the other hand, if the non-tradable sector represents the greater share of the GDP, the fixed exchange rate would be appropriate given the existence of intra-industry factor mobility.

3.0 Empirical literature

In conducting the review, two strands of extant literature exist: the proponents that regional trade intensity is a major determinant of business cycle synchronization and common currency formation and the antagonists that stipulate currency unification is disastrous and not optimal for all member countries. These two opposing views are juxtaposed as follows: Bocola (2006) investigated the determinants of business-cycle co-movement in Europe. Using a panel data of European countries for the period 1972 to 2004, the study found that bilateral trade intensity was a robust determinant of business cycle co-movement in Europe. It was also found that convergence in macroeconomic policies, especially fiscal policies, was associated to high degree of intra-European business-cycle correlation. The study concludes that pairs of countries with stronger trade linkages tend to have more highly correlated business cycles and higher trade intensity (specially more extensive intra-industry trade links) and more symmetric structures of production (as well as of exports and imports) leads to more synchronous cycles. Other extant studies that toe this line of argument are Kose and Yi

(2006), Calderón (2007), Nguyen (2007), Jules-Armand (2007), Grigoli (2008), Kappler (2009), Kwan and Yan (2009), Cheng, Chia and Dou (2009), Chang (2011), Pundit (2011), Déés and Zorell (2011), Antonakakis and Tondl (2011), Liao and Santacreu (2011), Juvenal and Monteiro (2012), Gong and Kim (2012), Xie, Cheng and Chia (2013), Duval, Cheng, Oh, Saraf and Seneviratne (2014), Alimi (2015), Gianelle, Montinari and Salotti (2017).

On the other hand, Nzimande and Ngalawa (2017) had it that the proposed Southern African Development Community (SADC) monetary union would be disastrous and not optimal for all member countries. This was because of the observed low, and sometimes negative business cycle synchronization amongst member countries. Other extant studies that also toe this line of argument are Ševela (2016), Pentecôte, Poutineau and Rondeau (2015), Blonigen, Piger and Sly (2013), Grigoli (2011).

However, despite the weak and contentious research formulations on the nexus or link between trade flows, macroeconomic policy and business cycle that these studies addressed, none of these extant studies emphasized the need for establishing a monetary union to harmonize regional macroeconomic policy in order to boost regional trade for business cycles synchronization. Furthermore, existing empirical literatures reviewed on the effects of trade-integration/bilateral-trade/trade-intensity and macroeconomic policies on business cycles synchronization are mainly in Europe, Asia and America. In Africa, and above all West Africa, research work in this area is still rare.

4.0 Methodology Analytical framework

The analytical framework underpinning this study is the Optimum Currency Areas which stipulates that output co-movements can be enhanced if countries trade intensively within

the same group of countries. On this basis, symmetry in trade flow could enhance regional business cycles synchronization. Stating this mathematically, we have

$$BS_{ijt} = f(TF_{ijt}) \dots \dots \dots (1)$$

In linear form,

$$BS_{ijt} = \beta_0 + \beta_1 TF_{ijt} + \varepsilon \dots \dots \dots (2)$$

Where $\beta_1 > 0$

BS_{ijt} = Level of synchronization of business cycle between countries i and j., and TF_{ijt} level of symmetry in trade flows between countries i and j at time t.

Also, for a country to be economically integrated as advanced by the OCA theory there is need for free flows of financial capital (assets) and physical capital together with the coordination of monetary and fiscal policies to address interest rate and inflationary shocks. Therefore, coordination of each national fiscal policy with the regional monetary policy will be necessary to mitigate the negative spillovers that could reduce business cycles synchronization. Therefore, the study incorporates monetary and fiscal policy variables into the equation thus

$$BS_{ijt} = f(MP_{ijt}, FP_{ijt}) \dots \dots \dots (3)$$

In Linear form,

$$BS_{ijt} = \beta_0 + \beta_1 MP_{ijt} + \beta_2 FP_{ijt} + \varepsilon \dots \dots \dots (4)$$

where $\beta_1 > 0, \beta_2 > 0$

BS_{ijt} = Level of synchronization of business cycle between countries i and j, MP_{ijt} = Level of symmetry in monetary policy between countries i and j at time t and FP_{ijt} = Level of symmetry in fiscal policy between countries i and j at time t. For symmetry in fiscal policy the study adopted the ECOWAS criteria of fiscal deficit to RGDP ratio, i.e., $\frac{FBAL_{it}}{RGDP_{it}} \leq 4\%$, and for monetary policy, we also consider the level of symmetry in broad money supply growth.

Also, the need to cushion the effect of emerging shocks and hence, synchronize the regional business cycle, the ECOWAS microeconomic convergence criteria that

recommend and external reserve equal to 6 months was also incorporated in the equation thus

$$BS_{ijt} = f(RSV_{ijt}) \dots \dots \dots (5)$$

In linear form,

$$BS_{ijt} = \beta_0 + \beta_1 RSV_{ijt} + \varepsilon \dots \dots \dots (6)$$

where $\beta_1 > 0$

RSV_{ijt} = Level of symmetry in external reserve to import ratio between countries i and j.

5.0 Model specification

To achieve the objective of the study, the study employed Seemingly Unrelated Regression Estimation (SURE) and Pearson correlation coefficient on computed z-scores. These were found appropriate when an entire distribution of X values is transformed into z-scores, the resulting distribution of z-scores will always have a mean of zero and a standard deviation of one. Therefore, owing to the fact that WAMZ and WAEMU member countries are different in size, structure and volume of trade, they were first standardized before the Pearson's correlation is computed. If the error terms are contemporaneously correlated, the Seemingly Unrelated Regression Estimation (SURE) provides better estimates of the parameter. Furthermore, given the fact that the variables under investigation are correlated within three year of non-overlapping intervals, Seemingly Unrelated Regression Estimation (SURE) becomes more appropriate. These equations are specified thus:

$$z_{it} = \frac{(\Delta y_{it} - \Delta \bar{y}_i)}{\sqrt{\frac{1}{T-1} \sum_{t=1}^T (\Delta y_{it} - \Delta \bar{y}_i)^2}} \dots \dots \dots (7)$$

Model 1 z-score

Model 11: Seemingly Unrelated Regression Estimation (SURE) Zellner (1962) developed the Seemingly Unrelated Regression (SURE) estimator for estimating models with $p > 1$ dependent variables that allow for different regressor matrices in each equation (e.g. $X_i \neq X_j$) and account for contemporaneous

correlation, i.e. $E(\varepsilon_{jt} \varepsilon_{jt}) \neq 0$. This is specified thus

$$\begin{matrix}
 \begin{bmatrix}
 BS_{1t-1} \\
 BS_{2t-1} \\
 \vdots \\
 BS_{Nt-1}
 \end{bmatrix} \\
 \begin{bmatrix}
 BS_{1t-1} & TF_{1t-1} & TF_{2t-1} & MP_{1t-1} & MP_{2t-1} & FP_{1t-1} & FP_{2t-1} & RSV_{1t-1} & RSV_{2t-1} & FDI_{1t-1} & FDI_{2t-1} & EXR_{1t-1} & EXR_{2t-1} & 0 & 0 & 0 & 0 & \dots & 0 \\
 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 \vdots & \vdots \\
 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -EXR_{1t} \\
 \vdots & \vdots \\
 \varepsilon_{1t} \\
 \vdots \\
 \varepsilon_{Nt}
 \end{bmatrix}
 \end{matrix} \quad (8)$$

Where TF = Trade flow, MP = Monetary policy, FP = Fiscal policy, RSV = External reserve, FDI = Foreign Direct Investment and EXR = Exchange rate. Thus, a SURE model is an application of the generalized least squares (GLS) approach and the unknown residual covariance matrix is estimated from the data.

6.0 Nature and Sources of Data

The data set for the paper were sourced from World Development Indicator (WDI) (2019), United Nations Commission on Trade and Development (UNCTAD) database (2019) and ADB statistics department estimates (2019). The variables are measured mainly in index or rate.

7.0 Empirical Results

This section of the paper presents results of the estimation using Pearson correlation coefficient on computed z-scores and Seemingly Unrelated Regression Estimation (SURE) for WAMZ and WEAMU ECOWAS member countries.

Table 1: Pearson Correlation Analysis for West African Monetary Zone (WAMZ)

Country pairs	Variables				Synchronization/ Symmetry level
	Business cycle	Trade Flow	Monetary Policy	Fiscal Policy	
Ghana-Guinea	0.500*	0.365	0.053	0.015	++ ++
Ghana-Gambia	0.389	0.864*	0.360	0.250	++ ++
Ghana-Liberia	-0.227	0.818*	-0.094	0.166	-++ +
Ghana-Nigeria	0.508*	-0.505*	0.529**	0.313	+- ++
Ghana-Sierra Leone	-0.020	0.455**	0.246	0.409	-++ ++
Guinea-Gambia	0.591*	0.362	0.340	0.120	++ ++
Guinea-Liberia	-0.350	0.748*	0.332	0.474**	-++ ++
Guinea-Nigeria	0.499**	-0.810*	-0.061	0.144	+++ +
Guinea-Sierra Leone	0.272	0.555*	0.171	0.108	++ ++
Gambia-Liberia	-0.323	0.791*	-0.045	0.154	-++ +
Gambia-Nigeria	0.367	-0.524*	0.135	0.371	+- ++
Gambia-Sierra Leone	0.080	0.449**	0.052	0.144	++ ++
Liberia-Nigeria	-0.230	-0.760*	0.403	0.672*	-- ++
Liberia-Sierra Leone	-0.270	0.660*	0.083	0.223	-++ ++
Nigeria-Sierra Leone	0.124	-0.702*	0.056	0.128	+- ++

(+) synchronous/symmetric; (-) asynchronous/asymmetric; (*) One percent level of significance; (**) Five percent level of significance

Results on table 1 reveal that Gambia was synchronous with Guinea, Ghana, Nigeria and Sierra Leone with correlation coefficient within the range of (0.08) and (0.59), but asynchronous with Liberia with a negative value of (0.32). Ghana was synchronous with Guinea and Nigeria within the range of (0.59) and (0.51) but mildly asynchronous with Liberia and Sierra Leone within the range of (-0.23) and (-0.02). Guinea is synchronous with Nigeria and Sierra Leone with coefficients of (0.50) and (0.07) but asynchronous with Liberia with coefficient of (-0.35). Nigeria is asynchronous with Liberia with coefficient of (-0.23) but synchronous with Sierra Leone with

a coefficient of (0.12), while Liberia was asynchronous with Sierra Leone with correlation coefficient of (-0.27).

On trade flows, Gambia had a symmetric flows of trade with Ghana, Liberia, Sierra Leone and Guinea with correlation coefficients of (0.36) and (0.86) but asymmetric with Nigeria with a coefficient of (-0.52). Ghana is symmetric with Guinea, Liberia and Sierra Leone with coefficients of (0.37) and (0.82) but asymmetric with Nigeria with a coefficient value of (-0.51). Guinea is symmetry with Liberia and Sierra Leone with coefficients of (0.75) and (0.55) but

asymmetric with Nigeria with a coefficient of (-0.81). Liberia is symmetry of (0.66) with Sierra Leone and asymmetry of (-0.76) with Nigeria, while Nigeria is asymmetry of (-0.70) with Sierra Leone. This weak symmetry and asymmetry within WAMZ is mainly due to their import dependent and non competitiveness of their products.

On the Monetary policy issue, that between Ghana and Liberia, Guinea and Nigeria as well as Gambia and Liberia were asymmetric with correlation coefficients of (-0.09), (-0.06) and (-0.05). Apart from Ghana and Nigeria with highly symmetric value of (0.53), the rest of other paired countries have a weak symmetric monetary policy. Therefore, despite the similarity targets of the convergence criteria, WAMZ sub region is yet

to be on the path of desired level of symmetry. On the Fiscal policy issue, apart from Liberia and Guinea with strong symmetric values of (0.47) and (0.67), the other paired counties are weakly symmetric. The weak symmetric is as a result of corruption, misappropriation. In all, the Pearson correlation analysis revealed that the level of synchronization of business cycles among Nigeria, Ghana and Guinea were significantly synchronized. But for all other countries, the results were mixed and had no clear-cut basis for any consideration for the formation of a monetary union. This finding confirm the finding of Bocola (2006) that bilateral trade intensity was a robust determinant of business cycle co - movement in Europe

Table 2: Pearson Correlation analysis for West African Economic and Monetary Union (WAEMU)

Country pairs	Variables				Synchronization/ Symmetry level
	Business Cycle	Trade Flows	Monetary Policy	Fiscal Policy	
Benin-Burkina Faso	0.817*	0.674*	0.399	-0.227	+ + +
Benin-Cote d'Ivoire	0.846*	-0.243	-0.305	0.381	+ - - +
Benin-Guinea Bissau	0.256	0.563*	0.013	-0.129	+ + +
Benin-Mali	0.816*	0.700*	-0.157	0.209	+ +- +
Benin-Niger	0.714*	0.843*	0.319	0.754*	+ + + +
Benin-Senegal	0.857*	0.859*	0.238	-0.036	+ + +
Benin-Togo	0.732*	0.864*	0.366	0.546*	+ + + +
Burkina Faso-Cote d'Ivoire	0.772*	-0.484**	-0.565*	-0.285	+ - - -
Burkina Faso-Guinea Bissau	0.245	0.425	-0.581*	0.299	+ +- +
Burkina Faso-Mali	0.680*	0.755*	0.114	-0.335	+ + +
Burkina Faso-Niger	0.870*	0.734*	0.345	-0.338	+ + +
Burkina Faso-Senegal	0.790*	0.879*	0.730*	-0.247	+ + +
Burkina Faso-Togo	0.847*	0.775*	0.277	-0.496**	+ + +
Cote d'IvoireGuinea Bissau	-0.102	-0.321	0.468**	-0.139	- - + -
Cote d'IvoireMali	0.841*	-0.566*	0.017	0.087	+ - + +
Cote d'IvoireNiger	0.826*	-0.582*	-0.302	0.322	+ - - +
Cote d'IvoireSenegal	0.883*	-0.445	-0.355	0.250	+ - - +
Cote d'IvoireTogo	0.892*	-0.519*	0.097	0.648*	+ - + +
Guinea BissauMali	0.243	0.650*	-0.223	0.135	+ +- +
Guinea Bissau-Niger	0.227	0.583*	-0.410	0.064	+ +- +
Guinea BissauSenegal	0.228	0.593*	-0.252	-0.722*	+ +- -
Guinea BissauTogo	0.079	0.652*	0.188	-0.421	+ + +
Mali-Niger	0.781*	0.838*	0.104	0.135	+ + + +
Mali-Senegal	0.925*	0.845*	-0.015	-0.330	+ +- -
Mali-Togo	0.818*	0.818*	-0.265	0.033	+ +- +
NigerSenegal	0.855*	0.855*	0.015	-0.160	+ + +
NigerTogo	0.939*	0.877*	-0.046	0.484**	+ +- +
SenegalTogo	0.857*	0.903*	0.538**	0.448	+ + + +

Source: Authors' Computation from the E View output, (+) synchronous/symmetric; (-) asynchronous/asymmetric; (*) One percent level of significance; (**) Five percent level of significance

As shown in table 2, within the West African Economic and Monetary Union (WAEMU), it is indicative that Benin Republic was synchronous with Guinea-Bissau, Burkina Faso, Cote d'Ivoire, Mali, Niger, Senegal and Togo with correlation coefficient within the range of (0.26) and (0.86). Burkina Faso is synchronous with Guinea-Bissau, Cote d'Ivoire, Mali, Niger, Senegal and Togo within the range of (0.24) and (0.87). Cote d'Ivoire is strongly synchronous with Mali, Niger, Senegal and Togo within the range of (0.83) and (0.89) but asynchronous with Guinea-Bissau with a coefficient of (-0.10). Mali is synchronous with Guinea-Bissau, Niger, Senegal and Togo within the range of (0.24) and (0.93).

Niger is also synchronous with Guinea-Bissau, Senegal and Togo within the range of (0.23) and (0.94). While Guinea Bissau is weakly synchronous with Senegal and Togo with coefficients of (0.23) and (0.08) Senegal is strongly synchronous with Togo with a coefficient of (0.86). The strong business cycle synchronization within the WAEMU sub region is mainly due to the fact that apart from Guinea-Bissau, all other WAEMU member countries share a common French heritage in their legal and administrative systems in addition to maintaining a common currency (CFA Franc).

On the trade flows, there is a strong symmetric between Benin Republic and Burkina Faso, Guinea-Bissau, Mali, Niger,

Senegal and Togo with correlation coefficients ranging from (0.56) and (0.86). Similarly, there is a strong symmetric between Burkina Faso and Guinea-Bissau, Mali, Niger, Senegal and Togo, with correlation coefficients ranging between (0.43) and (0.88). It is also strongly symmetric between Guinea-Bissau and Mali, Niger and Senegal with the coefficients of (0.58) and (0.65). Mali and Niger, Senegal and Togo, Niger and Senegal, Niger and Togo and Senegal and Togo are strongly symmetric in trade flows with coefficients values of (0.82), (0.85), (0.86), (0.88) and (0.90) respectively. However, Benin Republic with Cote d'Ivoire, between Burkina Faso with Cote d'Ivoire, Cote d'Ivoire and Guinea Bissau, Mali, Niger, Senegal and Togo the flow of trade are asymmetric. Therefore, trade flows in WAMZ is less symmetric than within WAEMU countries. This is so as WAEMU has an established monetary union whereas WAMZ member countries have lots of disparities in currencies.

Furthermore, the outcomes of monetary and fiscal policies are mixed as they are symmetric between some paired countries and asymmetric between some paired countries. This finding support the findings of Kose and Yi (2006), Calderón (2007), Nguyen (2007) that countries with stronger trade linkages tend to have more highly correlated business cycles, higher trade intensity and more symmetric structures of production leading to more synchronous cycles.

Table 4: Result of Seemingly Unrelated Regression for West African Monetary Zone (WAMZ)

Country Pairs	Independent Variables												
	BC(-1)	TF	TF(-1)	MP	MP(-1)	FP	FP(-1)	RSV	RSV(-1)	FDI	FDI(-1)	EXR	EXR(-1)
Ghana-Guinea	-0.48*	0.11*	0.32*	0.22*	0.98*	0.10*	-0.25*	-0.86*	-0.82*	0.78*	0.86*	0.09	1.06*
	←9.21)	←2.05)	←3.36)	←2.04)	←8.28)	←2.03)	←3.96)	←9.11)	←18.54)	←8.54)	←6.36)	←1.15)	←13.89)
Ghana-Gambia	0.77*	0.26	0.43	-0.32*	0.46*	-0.88*	0.29**	1.18*	1.26*	0.39**	0.69*	1.88*	-0.60*

	←3.36)	←1.20)	←1.34)	←2.47)	←6.07)	←3.87)	←1.97)	←3.75)	←6.07)	←1.84)	←4.58)	←3.33)	←2.74)
Ghana –Liberia	-0.44*	-0.01	0.86*	-0.98	-0.96	0.09	0.18	0.18	0.36	-0.84*	-0.86	0.13	-0.17
	←3.07)	←0.02)	←3.80)	←0.63)	←0.86)	←0.54)	←1.32)	←1.04)	←1.32)	←3.46)	←4.90)	←0.65)	←0.62)
Ghana –Nigeria	-0.49*	0.88*	0.64*	0.11	0.79*	1.17*	0.88*	0.25*	0.38*	-0.66*	1.25*	-0.91*	-0.36**
	←2.90)	←4.97)	←4.67)	←1.01)	←4.05)	←7.30)	←8.16)	←2.71)	←8.32)	←3.59)	←5.53)	←3.98)	←1.67)
Ghana –	0.45*	0.22*	-0.92*	-0.51*	-0.19*	-1.02*	-0.54*	0.42*	0.86*	-0.12	0.50*	-0.62*	-1.64*
Sierra Leone	←6.11)	←2.31)	←8.35)	←6.30)	←2.58)	←9.92)	←6.22)	←4.19)	←8.15)	←0.87)	←4.02)	←5.02)	←6.27)
Guinea - Gambia	0.16	0.19**	-0.28*	-0.10	-0.43*	0.14	0.23	-0.08	-0.18	-0.34*	-0.30*	-0.79*	-0.47*
	←1.31)	←1.68)	←2.15)	←0.76)	←4.09)	←1.32)	←1.48)	←0.77)	←1.45)	←3.32)	←2.80)	←5.16)	←4.20)
Guinea – Liberia	-0.40*	0.90*	0.98*	-0.22	-0.32	-0.90*	-0.96*	-0.19	-0.58*	0.36*	0.66*	-0.21	-0.41
	←2.45)	←3.35)	←4.35)	←1.37)	←1.47)	←2.93)	←3.93)	←1.22)	←3.03)	←2.33)	←4.33)	←1.01)	←1.41)
Guinea - Nigeria	-0.04	0.64*	0.71*	0.58*	0.76*	-0.08	1.10*	-0.2**	0.41*	-0.17	-0.35*	0.89*	-0.19*
	←0.28)	←5.75)	←8.73)	←3.40)	←8.54)	←1.23)	←11.84)	←1.93)	←4.60)	←1.36)	←3.85)	←6.00)	←2.34)
Guinea –	-0.03	0.30**	0.04*	-1.12*	-1.22*	-0.61*	-0.81*	0.75*	0.85*	0.39*	0.60*	0.61*	0.81*
Sierra Leone	←0.31)	←1.85)	←2.35)	←7.43)	←8.43)	←4.63)	←6.63)	←4.66)	←6.66)	←3.33)	←4.33)	←3.78)	←6.78)
Gambia - Liberia	1.30*	-1.14*	-0.58*	-1.33*	-0.63*	-0.13	-0.58*	0.87*	-0.74*	0.55*	-0.76*	1.96*	1.88*
	←4.30)	←3.40)	←3.89)	←4.72)	←2.84)	←0.66)	←2.99)	←5.77)	←2.58)	←3.15)	←2.42)	←3.46)	←6.31)
Gambia - Nigeria	-0.14	-0.77*	-0.36	-0.35*	0.43*	0.19	0.58*	-0.30*	-0.42*	0.004	0.032	-0.01	-0.12
	←0.98)	←4.24)	←1.55)	←2.35)	←4.30)	←1.33)	←3.82)	←2.37)	←3.30)	←0.03)	←1.30)	←0.06)	←0.30)
Gambia –	-0.02	0.38*	0.43*	-0.22	-0.34	0.05	0.08	-0.21	-0.43	0.36*	-0.71*	0.15	0.28
Sierra Leone	←0.11)	←2.42)	←4.98)	←1.48)	←1.48)	←0.31)	←0.98)	←1.37)	←1.48)	←2.24)	←3.37)	←0.61)	←0.84)
Liberia –Nigeria	0.64*	0.24	-0.82*	-0.61*	0.86*	-1.50*	-0.65*	-0.43*	-1.44*	1.00*	0.96*	0.01	0.44*
	←2.76)	←1.64)	←5.95)	←3.86)	←4.01)	←4.37)	←3.39)	←2.92)	←5.44)	←3.57)	←4.51)	←0.05)	←3.43)
Liberia –	-0.09	-0.64*	0.48*	-0.14	-0.26	0.48*	0.86*	0.71*	0.82*	-1.18*	-1.28*	-0.63*	-0.94*
Sierra Leone	←0.41)	←4.13)	←3.76)	←0.68)	←0.88)	←2.22)	←3.62)	←4.10)	←6.10)	←4.77)	←6.77)	←2.17)	←3.18)
Nigeria –	0.42*	-0.64*	-0.26*	0.36*	0.41*	-0.48*	-0.63*	-0.20	-0.56*	-0.11	-0.21	0.33*	0.46*
Sierra Leone	←4.10)	←7.12)	←3.42)	←7.41)	←7.24)	←6.05)	←8.01)	←1.68)	←4.94)	←1.57)	←1.58)	←4.56)	←3.35)

Source: Authors' Computation from the E - View output, t - statistics in parenthesis, * = 1%, ** = 5% and *** = 10%, BC = Business cycle, TF = Trade flows, MP = Monetary policy, FP = Fiscal policy, RSV = External reserve, FDI = Foreign Direct Investment and EXR = Exchange rate.

The results on Table 4 shows that symmetries in trade flows, monetary policy, fiscal policy, exchange rate, external reserve and foreign direct investment on business cycle synchronization among WAMZ revealed widely deviating results. While there is evidence to support a positive link between regional symmetric trade intensity and business cycle synchronization in eight paired member countries of Ghana–Guinea, Ghana – Gambia, Ghana – Nigeria, of Ghana – Sierraleone, Guinea – Gambia, Guinea –

Liberia, Guinea – Nigeria, Guinea – Sierraleone, Gambia – Sierraleone and Liberia – Nigeria, the rest of the other paired member countries revealed that increase in regional symmetric trade intensity leads to decreasing business cycle synchronization. The implication of this finding is that the harmonization of the regional trade flows intensity to enhance business cycle synchronization that will transmit into common currency formation has not been achieved simultaneously by all member

countries. Similarly, findings from regional symmetries in monetary policy, fiscal policy, exchange rate, external reserve and foreign direct investment on business cycle synchronization revealed that it is difficult to achieve primary and secondary convergence

criteria simultaneously among the WAMZ member countries. However, Nigeria, Ghana and Guinea proved to be the most similar compared to the other pair of countries under WAMZ.

Table 4: Result of Seemingly Unrelated Regression for West African Economic and Monetary Union (WAEMU)

Country Pairs	Independent Variables												
	BC(-1)	TF	TF(-1)	MP	MP(-1)	FP	FP(-1)	RSV	RSV(-1)	FDI	FDI(-1)	EXR	EXR(-1)
Benin - Burkina Faso	-0.13 (-1.31)	-2.38* (-9.28)	3.32* (11.28)	-0.34* (-2.85)	-1.80* (-9.14)	-2.35* (-9.28)	0.70* (5.65)	-0.02 (-0.11)	1.01* (9.52)	1.93* (11.40)	3.70* (9.84)	2.57* (10.69)	2.94* (9.86)
Benin - Cote d'Ivoire	1.07* (2.83)	-1.76* (-2.96)	-1.84* (-4.66)	0.87* (3.35)	1.20* (8.36)	0.59* (3.72)	-0.94* (-3.71)	-1.35* (-3.39)	-1.18* (-3.29)	1.18* (3.37)	1.86* (6.31)	0.72* (2.27)	0.86* (3.74)
Benin - Guinea-Bissau	1.11* (9.59)	-0.73* (-10.67)	0.28* (3.48)	-0.07 (-1.25)	-0.18 (-1.36)	-0.32* (-4.28)	-0.64* (-6.28)	0.05 (0.81)	-0.51* (-8.06)	-0.98* (-15.42)	0.83* (7.25)	0.22* (4.82)	0.83* (6.84)
Benin - Mali	0.78* (5.62)	-0.27* (-2.34)	-0.79* (-4.86)	-0.35* (-3.12)	-0.64* (-4.33)	-0.11 (-1.11)	-0.32* (-3.32)	-0.28* (-3.03)	-0.86* (-4.23)	0.27* (2.79)	0.68* (4.71)	-0.36* (-3.23)	-0.62* (-4.26)
Benin - Niger	0.55* (2.07)	0.46** (1.76)	0.82* (2.82)	-0.21 (-0.80)	-0.43 (-1.20)	0.38** (1.75)	0.84* (2.11)	-0.49** (-1.82)	-0.80* (-2.64)	-0.07 (-0.38)	-0.08 (-1.20)	-0.20 (-0.73)	-0.42 (-0.86)
Benin - Senegal	1.71* (11.11)	1.02* (9.85)	1.43* (11.21)	-0.27* (-3.20)	-1.05* (-10.67)	0.46* (3.36)	-1.82* (-8.44)	-0.63* (-7.76)	-0.32** (-2.01)	-0.30* (-2.95)	-0.40* (-3.36)	-0.78* (-9.74)	-1.41* (-13.99)
Benin - Togo	0.44* (3.43)	-0.22 (-1.42)	0.48* (2.79)	-0.84* (-3.15)	-1.84* (-6.15)	-0.39 (-1.33)	0.64* (4.20)	0.30* (2.95)	-0.81* (-6.19)	-0.22 (-0.96)	-0.64 (-1.26)	-0.49* (-5.19)	0.14 (1.28)
Burkina Faso - Cote d'Ivoire	1.75* (4.61)	0.06 (0.39)	-0.26 (-1.30)	0.86* (3.30)	0.38** (1.83)	-1.42* (-3.96)	-0.50* (-3.09)	0.95* (5.93)	0.42* (2.61)	0.53* (3.82)	0.42* (2.60)	-1.04* (-6.99)	-0.58* (-3.71)
Burkina Faso - Guinea-Bissau	-2.11* (-7.22)	-1.42* (-8.18)	0.87* (5.06)	-0.16 (-1.12)	-0.67* (-4.87)	1.12* (6.49)	0.65* (4.39)	0.48* (3.52)	0.08 (0.53)	1.07* (5.23)	2.31* (8.02)	2.21* (9.02)	1.12* (4.88)
Burkina Faso - Mali	0.91* (9.50)	1.32* (11.14)	2.20* (12.11)	1.87* (8.66)	-0.56* (-5.22)	0.76* (5.38)	0.83* (8.50)	-1.93* (-11.34)	-1.88* (-10.16)	-2.13* (-10.45)	0.51* (4.48)	0.12 (1.32)	1.96* (11.93)
Burkina Faso - Niger	0.53* (2.61)	0.003 (0.01)	0.023 (1.01)	-0.47* (-2.38)	-0.86* (-3.21)	0.04 (0.28)	-0.54* (-3.42)	0.56* (3.80)	0.42* (3.40)	0.13 (1.13)	-0.30** (-2.31)	-0.67* (-2.93)	0.51* (2.51)
Burkina Faso - Senegal	-0.09 (-0.50)	0.18 (0.79)	0.26 (1.23)	-0.42* (-2.95)	-0.20** (-1.95)	0.36* (3.47)	0.38** (2.36)	-0.17** (-1.52)	-0.86* (-2.41)	0.18** (1.51)	0.64* (2.40)	0.85* (6.08)	0.68* (8.00)
Burkina Faso - Togo	0.93* (8.01)	0.07 (0.85)	0.28* (3.30)	0.41* (5.66)	0.64* (8.32)	-1.33* (-9.30)	-1.62* (-8.30)	-0.41* (-3.79)	-0.22** (-2.34)	-1.51* (-11.63)	-1.20* (-13.30)	0.64* (8.69)	-0.58* (-7.65)
Cote d'Ivoire - Guinea Bissau	0.41* (2.59)	0.64* (2.92)	0.81* (3.43)	0.97* (5.64)	0.34 (1.29)	1.08* (4.52)	-0.54* (-3.08)	0.31 (1.32)	0.60 (1.43)	-0.04 (-0.29)	-0.53* (-3.76)	-1.04* (-3.19)	-1.13* (-6.23)

Source: Authors' Computation from the E - View output, t - statistics in parenthesis, * = 1%, ** = 5% and *** = 10%, BC = Business cycle, TF = Trade flows, MP = Monetary policy, FP = Fiscal policy, RSV = External reserve, FDI = Foreign Direct Investment and EXR = Exchange rate

The results on the whole shows that in a given period, the level of symmetry on trade flows, monetary policy and fiscal policy between pair of countries result in a significant increase in the level of synchronization of business cycles between the country pairs both in the current and previous period. In this situation their macroeconomic policies were optimal. The pair of countries which fall within this category are Burkina Faso-Mali, Cote d'Ivoire-Guinea Bissau, Cote d'Ivoire-Mali, Cote d'Ivoire-Senegal, Cote d'Ivoire-Togo, Guinea Bissau-Mali, as well as Guinea Bissau-Senegal. However, few pair of countries especially Benin and Niger Republic do not seem to be similar from the result of seemingly unrelated regression analysis.

8.0 Conclusion/ Recommendation

There is a clear indication that most countries within WAMZ are still far from achieving the conditions necessary for the formation of a monetary union. The few with the level of symmetry in trade flows, monetary and fiscal

policies that could eventually synchronize regional business cycles are Ghana, Nigeria and Guinea. However, for Ghana and Nigeria, Guinea and Nigeria, the level of symmetry in their index of exchange rate do not synchronize with the business cycles. On this basis, exchange rate alignment in pegging the Ghanaian cedi and Nigerian naira as well as Guinean franc and Nigerian naira to the common currency is recommended. Similarly, WAEMU member countries that are strongly symmetric such as Burkina Faso-Mali, Cote d'Ivoire-Guinea Bissau, Cote d'Ivoire-Mali, Cote d'Ivoire-Senegal, Cote d'Ivoire-Togo, Guinea Bissau-Mali, as well as Guinea Bissau-Senegal should also realign its exchange rate. Therefore, achieving the criteria necessary for common currency formation simultaneously by all member countries is elusive task. On this note, countries with symmetric levels should form the West African Monetary Union beyond 2020 and creating room for others who satisfy the criteria to join subsequently.

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APPENDIX

Convergence Criterion achieved by WAMZ countries within year 2001 to 2009

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009
The Gambia	2	1	1	3	3	4	4	4	3
Ghana	1	0	2	2	2	2	2	0	0
Guinea	3	2	0	0	2	1	2	2	3
Liberia	=	=	=	=	=	=	=	=	4
Nigeria	3	3	2	3	3	4	4	3	3
S. Leone	2	2	0	2	2	2	2	2	2

Source: (WAMI Macroeconomic Convergence Reports, 2011)

	2015	2016	2017	2018	2019	2020	2021	2022
First order criteria	Est.			Projections				
Overall balance /GDP (≥ -3 percent)	5	8	5	6	1	1	0	0
Average consumer price inflation (≤ 3 percent)	0	0	0	0	0	0	0	0
Total debt/GDP (≤ 70 percent)	1	1	1	1	0	0	0	0
Sccond order criteria								
Wages and salaries/tax revenue (≤ 35 percent)	6	6	6	6	5	5	4	4
Tax revenue/GDP (≤ 20 percent)	8	7	7	7	7	7	7	7

Source: WAEMU, BCEAO and IMF staff estimates and projections.

Fluctuations of Macroeconomic Variables and Manufacturing Output: Issues, Challenges and Prospects of the Growth of Manufacturing Output in Nigeria.



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Abstract

The study examined the impact of fluctuations of macroeconomic variables such as exchange rate, lending rates and inflation rates on the manufacturing output in Nigeria. The paper used descriptive analysis to investigate the relationship between manufacturing output and macroeconomic stability in Nigeria. The findings revealed that macroeconomic instability impacted negatively on the manufacturing output. The paper therefore recommended that policies that will streamline the multiple and volatile exchange rates, interest rate and inflation control should be designed and implemented to ensure their predictability to aid planning and attract both domestic and foreign investors to the, manufacturing sector. This is expected to increase manufacturing output in Nigeria

Key Words; Fluctuations, Macroeconomic Variables, Manufacturing Output, Issues and Challenges, Nigeria

1.0 Introduction

Nigeria has in the past adopted several policy reforms by various political dispensations in an attempt to strengthen the manufacturing sector and one of such policy reforms is the Structural Adjustment Programme (SAP) which was introduced in 1986 (Oyinbo and Emmanuel, 2012). A key component of the reform is the exchange rate deregulation.

The nation's currency, the naira, was considered to be overvalued and that helped to cheapen imports and made exports expensive, hence the deregulation of the currency. Cheap imports also increased their demand, put pressure on foreign exchange and worsened balance of payments. Thus, Nigeria moved away from fixed to flexible exchange rate regime allowing for significant depreciation of the naira aimed at enhancing local production, making Nigerian goods cheaper and boosting exports (Shittu, Ashaolu and Phillip, 2007). The study adopted the descriptive methodology technique to review and examine the effect of Fluctuations of Macroeconomic Variables and Manufacturing Output in Nigeria: Issues, Challenges and Prospects for the growth of the Manufacturing Output in Nigeria.

1.2 Statement of Problem

Empirical evidence reveals that an over-valued exchange rate makes import cheaper and damps inflation by controlling price rise for an import dependent country but the export led industries were not favorable especially manufacturing industries by increasing the cost of exports which caused reduction in inflow of foreign capital leading

to unsustainable balance of payments deficits (Achugamonu, Okorie, Taiwo and Okoye, 2017). On the other hand, evidence from literature also shows that constant devaluation of the naira increased the cost of imported production input thereby fueling inflationary pressures (Tams-Alasia, Olokoyo, Okoye and Ejemeyovwi (2018).

The manufacturing sector in Nigeria has over several decades exhibited low-capacity utilization and this has led to the low contribution to Gross Domestic Product (Ojo, 1970). The low level of capacity utilization has also led to low level of manufacturing output and development which has over the years been attributed to over dependence on the external sector for the importation of most of the inputs required for the manufacturing in the sector (Okigbo, 1993).

Importation of inputs was also affected by the scarcity of foreign exchange which had over the years resulted in low productivity in the manufacturing sector. The introduction of Structural Adjustment Programme (SAP) created a challenge for the sector most especially the deregulation of exchange rate. The deregulation consequently led to unstable and rising exchange rates over the years (Ochei, Areghan and Tochukwu, 2016).

In literature it is noted that devaluation of currency makes exports cheaper and imports costlier so with fairly inelastic demand foreign exchange earnings from exports will increase and imports bills reduced and thereby improving the viability of balance of payments position.

Due to conflicting result of empirical studies

carried out on the effect of macroeconomic variables on manufacturing output in Nigeria, this work therefore aims at investigating the impact of fluctuations of macroeconomic variables on the manufacturing output, specifically it's issues, challenges and prospects for the development of manufacturing output is evaluated. It is important to know the effect of exchange rate deregulation which resulted to massive devaluation of the Nigerian naira, on manufacturing output in Nigeria. The role that interests rate and price level play in the interaction with exchange rate on the output of manufacturing sector in Nigeria.

2.0 Stylized Facts on Macroeconomic instability and Manufacturing output Growth in Nigeria

The manufacturing sector is dominated by a handful of industrial groups namely; beverages (beer, soft drinks and spirits), textiles, tobacco, and coal products. Over 90% of total output are consumer items. There are hardly any productions of capital or intermediate goods. In the fourth National Development Plan in Nigeria, over 60% of total raw materials consumed in the manufacturing sector was imported. What is painful is that Nigeria has the potential to be self-sufficient is some of the hitherto imported items like food and dairy products, cereals, etc. Approximately 2% of the labour force in industry is made up of foreigners who dominate the technological and managerial expertise in this sector. Because of the over dependence on imported raw material the price of locally manufactured product is very high and not competitive with imported ones and also the quality is suspicious. In the face of FEM and the high exchange rate of the

Naira, cost of foreign exchange for the firms that cannot afford adequate capital to import sufficient raw materials operated far below maximum rate of capacity utilization. This causes retrenchment and increases unemployment. The industries in Nigeria are dominated by small and medium scale enterprises. Most of these firms are owned by sole proprietors or operates as family businesses with questionable characters.

Another feature of the industrial sector is its lopsided development. This has led to the efforts of the Federal Government to restructure the entire economy especially the industrial sector to make it more competitive to face the challenges of reviving our depressed economy. Export-oriented industries are given priority because it is believed they will export and earn some foreign exchange and in the long run enable the country to earn sufficient foreign exchange to liquidate her outstanding external debt.

Secondly, the special location of industries in Nigeria is not conducive to balanced economic development. Industries are clustered round few areas particularly, Lagos, Port Harcourt, Ibadan, Kano, Kaduna, Onitsha, Nnewi, Aba, Enugu. Although Industrialization was accorded an important place in the 4th National development plan (1981-1985).

3.0 Literature Review

3.1. Conceptual Literature Review

3.1.1 Review of Exchange Policy Regimes in Nigeria

The exchange rate policy regime in Nigeria has undergone substantial transformation since post-independence era owing from

when the country operated a fixed exchange rate system from 1960 to 1986 to when a market-based exchange rate regime was introduced in the context of the Structural Adjustment Programme (SAP) (Tamunonimim and Reginald, 2013). He further observes that before 1973, Nigeria's exchange rate policy was in consonance with the International Monetary Fund (IMF) par value or fixed exchange system. The Nigerian currency has its exchange rate largely subjected to administrative management because it was not a traded currency. The exchange rate was dictated by the fortunes or otherwise of the British Pound Sterling up to 1967 when the Pound was devalued and thereafter, the country switched to the dollar. The Naira was adjusted in relation to the dollar following the breakdown of the International Monetary Fund (IMF) par value system in December 1971. In 1978, the Naira was pegged to a basket of 12 currencies comprising Nigeria's major trading partners. Throughout the 1970s except 1976 and 1977, the nominal exchange rate appreciated every year. The policy encouraged heavy reliance on imports which ultimately led to balance of payments problems and depletion of external reserve. Nevertheless, up to the time of SAP, exchange rate policy encouraged the overvaluation of the Naira as reflected in real exchange appreciation particularly in the 1970s (Obadan, 1993b, 1994 and 1995).

Obaseki (2001) opines that because the exchange rate control system was unable to evolve an appropriate mechanism for foreign exchange allocation in consonance with the goal of internal balance, it was discarded on September 26, 1986 while a new mechanism was evolved under the Structural Adjustment

Programme (SAP) introduced in 1986. According to Anyanwu, Oyefusi, Oaihenan, and Dimowo, (1997), The main objectives of the exchange rate policy under SAP was to preserve the value of the domestic currency, maintain a favorable external reserve position and ensure balance without compromising the need for internal balance and the overall goal of macroeconomic stability.

A transitory dual exchange rate system was adopted in September, 1986, but metamorphosed into the Foreign Exchange Market (FEM) in 1987 (Bamidele, 2005). Bureau de Change was introduced in 1989 with a view to enlarging the scope of the FEM. In 1994, there was a policy reversal, occasioned by the non-relenting pressure on the foreign exchange market. Further reforms such as the formal pegging of the Naira exchange rate, the centralization of the foreign exchange in the CBN, the restriction of the Bureau de Change to buy foreign exchange as agent of the CBN, etc, were introduced in the Foreign Exchange Market in 1994 as a result of volatility in exchange rates (Soludo, 1993).

There was another policy reversal in 1995 to that of 'guided deregulation'. This necessitated the institution of the Autonomous Foreign Exchange Market (AFEM) which later metamorphosed into a daily, two-way quote Inter-Bank Foreign Exchange Market (IFEM) in 1999. The Dutch Auction system (DAS) was reintroduced in 2002 as a result of the intensification of the demand pressure in the foreign exchange market and the persistence in the depletion of the country's external reserves. The DAS was conceived as a two-way auction system in

which both the CBN and the authorized dealers would participate in the foreign exchange market to buy and sell foreign exchange (Obaseki, 2001).

The official exchange rate in Nigeria is determined by the monetary authority (that is the Central Bank of Nigeria) calculated on an annual average based on monthly averages relative to the US dollar. In the early 1970's the official exchange rate of the naira to the US dollar ranged from 0.5-0.7naira to one US dollar. When the Structural Adjustment Program was initiated in 1986, there was inconsistency in the exchange rate regime in Nigeria. Nigeria moved from a pegged exchange rate regime to flexible exchange rate regime which aided the government to keep the exchange rate at a relatively stable level of 0.89naira to the US dollar in 1985 (Soludo, 1993).

Despite various efforts by the government to maintain a stable exchange rate, the inconsistency in policies and lack of continuity in exchange rate policies has aggravated the unstable nature of the naira which rose rapidly in year 2000 to a rate of 102.11naira to the one US dollar. The rate has since been increasing consistently and up to 2018 when it attained the rate of 306.08naira to one US dollar (CBN Statistical Bulletin, Various Years). In the foreign exchange market, there exist not one unique exchange rate, but different rates depending upon the instrument used in the transfer function. The major types of exchange rates are as follows:

- a) **Spot Rate:** Spot rate is the rate at which foreign exchange is made available on the spot. According to Obadan (2006),

the spot foreign exchange rate is the market where currencies are bought and sold for immediate delivery or delivery within a few working days.

- b) Forward Rate:** Forward rate of exchange is the rate at which the future contract for foreign currency is made. The forward exchange rate is settled now but the actual sale and purchase of foreign exchange occurs in future (Obadan, 2006). The forward rate is quoted at a premium or discount over the rate.
- c) Long Rate:** Long rate of exchange is the rate at which a bank purchases or sells foreign currency bills which are payable at a fixed future date. The basis of the long rate of exchange is the interest on the delayed payment (Jhingan, 2005).
- d) Fixed Rate:** Fixed or pegged exchange rate refers to the system in which the rate of exchange of a currency is fixed or pegged in terms of gold or another currency (Pugel and Lindert, 2002).

There are various exchange rate regime options available to countries for adoption. These range from floating exchange rate regime at one extreme to fixed exchange rate regime at the other extreme, called bi-polar system with the remaining regimes falling on a continuum in between. These include pegs, target zones and fixed but adjustable rates (Udoye, 2009).

- i. Fixed Exchange Rate Regime is a system in which the exchange rate of a country remains constant or stays within some small margin of fluctuation around a

constant par value and the government or the monetary authorities will participate in the foreign exchange market to sustain it (Sanusi, 2004).

- ii. Floating Exchange Rate Regime is a system in which the exchange rate is determined by forces of demand and supply of foreign currencies. It is said to be self-correcting as any differences in demand and supply will automatically be corrected in the market (Sanusi, 2004). However, the degree of government participation and market forces determination may vary among countries. Therefore, in practice, no exchange rate is pure float, fixed or completely determined by market forces, rather, the prevailing system is the managed float type, whereby there is periodic intervention by monetary authorities in the foreign exchange market to attain strategic objectives (Mordi, 2006). Since the adoption of the Structural Adjustment Programme in 1986, a managed float exchange rate regime remains dominant in Nigeria.

3.1.2 Review of the concept of Manufacturing Output in Nigeria

The manufacturing sector is a sub-sector of the industrial sector which involves the conversion of raw materials into finished consumer goods or intermediate or producer goods. The manufacturing sector creates an avenue for employment, helps to diversify the economy, increase foreign exchange earnings, boost agricultural production through backward linkage and helps to fully utilize the nation's resources. The output of the manufacturing sector in Nigeria consists

of the total output of all industries producing goods and services in the country. The output of the sector is measured by the index of manufacturing production. The production growth rates have been generally low and sometimes negative particularly since the 1980s following the global economic crises which seriously affected Nigeria foreign exchange earnings from the sale of crude oil (Udo, 2014).

The output of manufacturing industry measured by the index of manufacturing output was 24.1 in 1970 increased to 128.6 in 1982. There was a decline in manufacturing output from 1983 to 1986 from 94.8 to 78.2. The index of manufacturing was only 78.2 in 1986. This decline was as a result of the downturn in the Nigerian economy, caused by the fall in world prices of crude oil, which culminated into the adoption of Structural Adjustment Programme (SAP) in July, 1986 (Simbo, Iwuji and Bagshaw, 2012). The various SAP-induced industrial policies and incentives adopted helped to boost manufacturing output for a short while (Udo, 2014). The index of manufacturing production rose to 130.8 in 1987 and reached its peak of 178.1 in 1991. Because there was no in-built mechanism to sustain the growth, it declined to 145.2 and 133.1 in 1993 and 1998 respectively. Between 1999 and 2003, there was a marginal increase in manufacturing production. The index of manufacturing production stood at 137.1 in 1999 and 147.1 in 2003. It declined abruptly to about 145.7 in 2004 and 2005 (CBN Annual Report and Statement of Accounts (Various Issues) as cited in Udo, 2014).

Consequently, the index of the manufacturing output exhibited declining trend from 2006 to 2010 with an average output of 91.2 and has been relatively stable from 2011 till date with an average output of 93.2 (NBS, 2018).

3.2 Empirical Literature Review

Tams-Alasia, Olokoyo, Okoye, Ejemeyowwi (2018) examined the impact of exchange rate deregulation on manufacturing output performance in Nigeria over the period 1980-2016. The normalized cointegration technique, the granger causality and the error correction model (ECM) were employed in the study. The empirical findings revealed that high exchange rate affects the manufacturing industry output. The study thus recommends the use of appropriate monetary policy and other programs by the monetary authorities to stabilize exchange rate and attain the mandate of exchange rate management.

Ochei, Areghan and Tochuchwu (2016) evaluated the deregulation of foreign exchange market and its effect on industrial produce in Nigeria from 1970 to 2013 using Ordinary Least Squares Econometric Techniques, and their findings reveals that labour and capital has a positive impact on industrial output with inflation exerting a negative effect. The study recommends prioritization of education sector and provision of long-term funds for the growth of the manufacturing sector. The method of estimation looks too simplistic to capture the dynamics of the interrelationship amongst the variables concerned, the recommendation has no relationship with the findings of the work and the finding of the study deviated from its objectives.

Akinlo and Lawal (2015) examines the impact of exchange rate on industrial production in Nigeria over the period 1986 to 2010. Using the Vector Error Correction Model (VECM), the study indicated that there is a long run relationship between industrial production index, exchange rate, money supply and inflation rate and in the short run exchange rate deregulation has no perceptible impact on industrial production but in the long run there is a positive impact. The result of the study also showed that money supply explains a very large portion of variation in the industrial production in Nigeria.

Onyeizugbe and Umeagugesi (2014) examined how devaluation of the naira affects the survival of the industrial subsector in Nigeria during the period 1990 to 2013, using Ordinary Least Square (OLS) regression method. The result showed that exchange rate and export have a positive effect on manufacturing capacity utilization. The study thereby recommended that manufacturing firms should embark on production of quality goods and the Government should encourage the development of local industrial subsector. The recommendations of research study are not specific (what are quality goods). Harry and Steven (2010) examined the performance of Nigerian manufacturing sector. Their study identified and analyzed the major problems and limitations manufacturing sector and concluded that it is important to work towards resolving these problems in order to rejuvenate the Nigerian manufacturing sector so it can play its role of driver of economic development.

Musa and Sanusi (2013) carried out a study on the aggregate industrial output to relative change in prices and exchange rate in Nigeria between 1970- 2011, using a Vector Error Correction (VEC) model. The study shows that there is a long run relationship between the exchange rate and the industrial sector. The study further recommended that proper policy management of the exchange rate and inflation should be encouraged.

Bakare (2011) also carried out a study on effect of foreign exchange rate policy reforms on domestic investment in Nigeria. The study adopted the OLS estimation technique using the ordinary least square multiple regression analytical method. The findings revealed that there is a negative relationship between the different foreign exchange rate regimes and domestic investment in Nigeria.

Magda, Hakan and Nergiz (2006) examined the Effect of Exchange rate fluctuation on economic activity in Turkey. They adopted the Granger Causality technique to analyse the asymmetric effects of exchange rate shocks on relevant macroeconomic variables. Their study reveals that anticipated appreciation of the exchange rate, current and lagged has a negative effect on output growth in Turkey. Also, the unanticipated appreciation is not significant in explaining real output growth. However, their study shows that lagged unanticipated depreciation has a positive effect on output growth. The variable used for regression is lumped up and this will lead to difficulty in use of the recommendations of this research work by the government.

Kandil (2004) examines the effect of exchange rate fluctuation on real output growth and price inflation in a sample of twenty-two countries. The model demonstrates the effects of demand and supply channels on the output and price responses to changes in the exchange rate. The study concludes that exchange rate depreciation both anticipated and unanticipated decreases real output growth and increases price inflation.

Obaseki (2001) carried out a study on the issues in exchange rate policy design and management. After a brief review of models of exchange rate determination and exchange rate mechanisms, the findings revealed that exchange rate adjustment is required to correct flow balance of payment deficit, while reserves drawn down, in addition to demand management, could prove efficacious in reversing a temporary or stock balance of payment deficit.

3.3 Theoretical Framework

The theoretical framework on which this study is built, is the International Fisher Effect (IFE) theory which traces the links among interest rate, inflation rate and exchange rate. This theory states that an appreciation or depreciation of one currency against another currency might be neutralized by a change in the interest rate differential. According to the theory, if the US interest rate for example exceeds Nigeria's interest rate, then the US dollar should depreciate against the Nigeria Naira by an amount that prevents arbitrage. The future exchange rate is reflected in the forward exchange rate stated today. In the

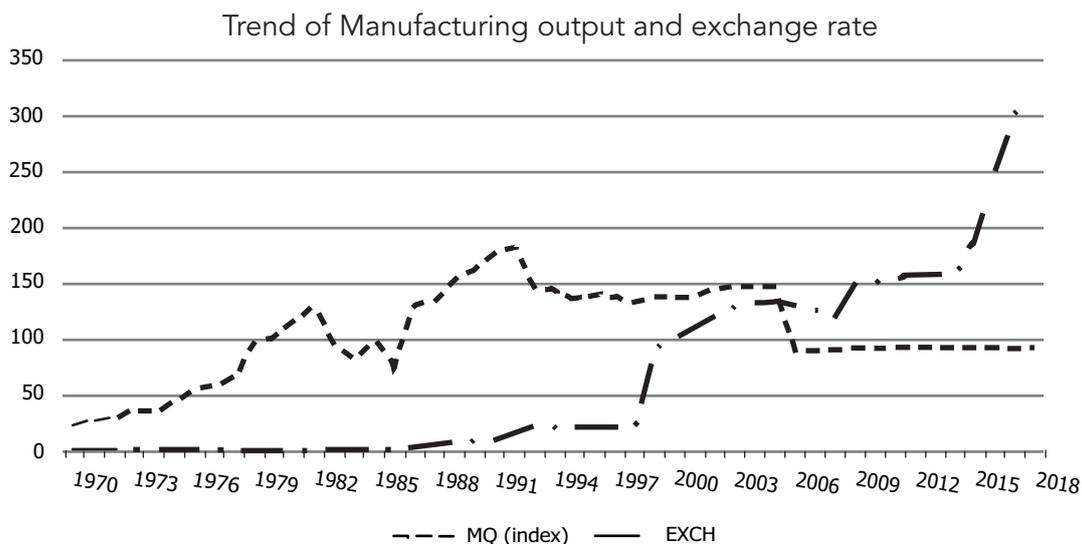
example above, the forward exchange rate of the dollar is said to be at a discount because it buys fewer Nigerian Naira in the forward exchange rate than it does at the spot rate, the naira is said to be at a premium. Therefore, following the International Fisher Effect there will be a tendency for countries with relatively high nominal interest rate (which generate inflationary pressure) to have depreciating currencies (depreciating exchange rate) and those with relatively low nominal interest rates to have appreciating currencies (Madura, 2010). This can be seen during the deregulation of the exchange rate in Nigeria in the year 1988, when the interest rate stood at 16.62% and the exchange rate 4.53 to 1 US dollar, but this was inflationary with 34.24% inflation rate. Import of raw materials became very expensive while export was cheap, but Nigeria products faced fierce competition from other international products and were invariably expensive. This adversely affected the performance of manufacturing output in Nigeria.

4.0 Effects of changes in Macroeconomic variables on Manufacturing output in Nigeria.

4.1.1 Trend Analysis of the Variables

A trend analysis enables us to observe the behaviour of the variables over the years, this could help in the ability to predict or forecast future behaviour.

Figure 4.1: Trend of Manufacturing Output and Exchange Rate

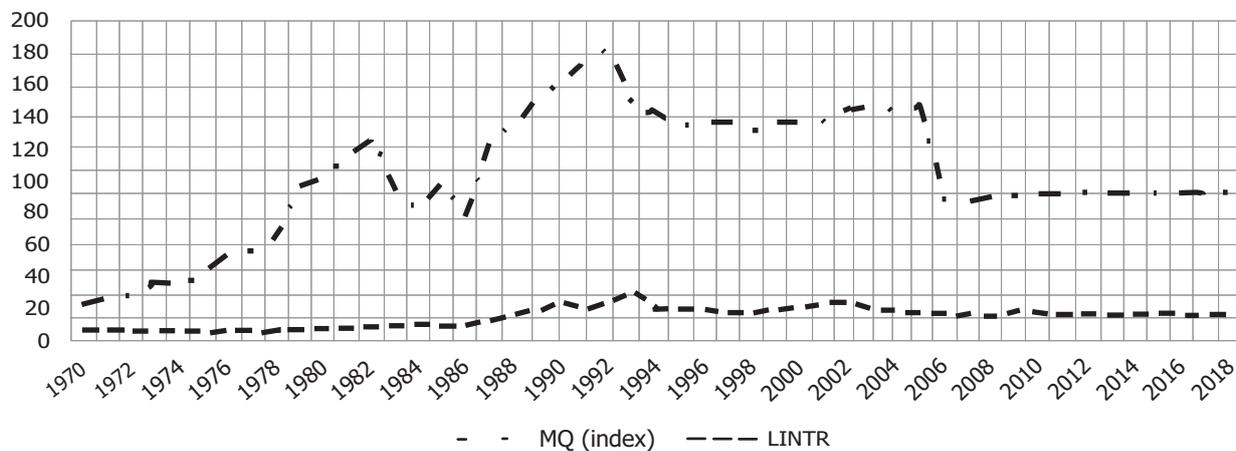


Source: Author's Computation 2020

Figure 4.1 shows the trending pattern of manufacturing output and exchange rate during the period 1970 to 2018. It shows a relatively stable pattern of movement in exchange rates during the 1970 to 1998 periods and a steady rise between the 1999 and 2018 periods with a slight drop in 2008. The pattern of the manufacturing output index shows a relatively stable rise between the period 1970 to 1992, this was the period when the exchange rate was low. The manufacturing output index shows a steady low trend between 1992 to 2005, which was the period of rise in exchange rate. The exchange rate and manufacturing output

were in equilibrium in the year 2005, this was the period when the manufacturing output was declining rapidly. Since the rapid decline in manufacturing output between the period 2005 to 2006, the manufacturing output has been relatively low from the period 2006 to 2018. The decline between the 2006 to 2018 periods can be attributed to the recessionary pressure on the economy and the inherent volatility associated with foreign exchange rates during the period, making it difficult for manufacturers to maintain the supply of essential raw materials necessary for manufacturing production process.

Figure 4.2: Trend of Manufacturing Output and lending Interest Rate

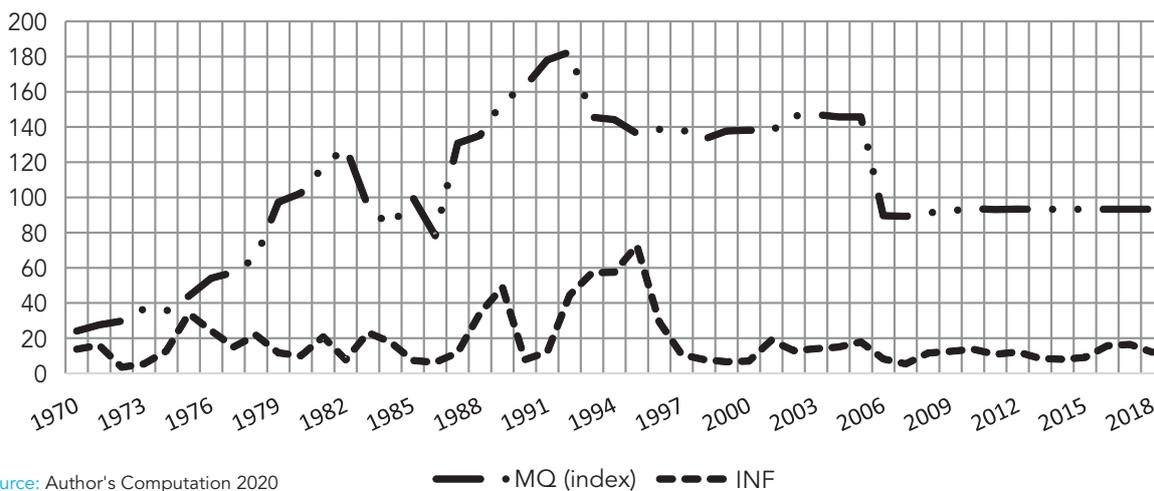


Source: Author's Computation 2020

Figure 4.2 shows the trend pattern of manufacturing output and lending interest rate during the period 1970 to 2018. The trend pattern shows a relatively stable pattern of movement in lending interest rates during the 1970 to 1987 periods and a slight rise between the 1986 and 1994 periods. However, the lending interest rate has been relatively stable from the period 1995 to 2018. The manufacturing output in the period of low and stable lending interest rate was rising and reached its peak in the period 1982 and began to drop between the period 1983 and 1985, with a sharp drop in the period 1986. This period of sharp drop in the manufacturing output coincides with the

period when the lending interest rate began to rise. From the period 1986 to 1992, the manufacturing output has been rising and had a sharp drop in 1993 which also coincide with the peak of the lending interest rate in the 1993 period, from this period of sharp decline, the manufacturing output has been fluctuating between the period 1994 to 2005 with a sharp drop again in the period 2006 and has been relatively stable till the period 2018. The pattern of movement between the aforementioned variable shows that there is an economic relationship between them, that is lending interest rate influences the trend of manufacturing output.

Figure 4.3: Trend of manufacturing output and Inflation Rate



Source: Author's Computation 2020

Figure 6.3 shows the trend pattern of manufacturing output and inflation rate during the period 1970 to 2018. The trend pattern shows an unstable pattern of movement in inflation rates during the 1970 to 2018 periods which is made up of varying degrees of ups and down with its highest peak in the 1995 period and lowest in the 1972 period. These periods of very high manufacturing output are complemented with a low inflation rate signifying that

inflation rate determines the trend of manufacturing output.

5.0 Findings, Conclusions and Policy Recommendations.

1. From the graphical illustration, it was observed when exchange rate was low, manufacturing output was on the rise. But with a slight increase in exchange rate led to a sharp fall in manufacturing output, this fall lasted for a period but picked up in the

succeeding period. But with the continuous rise in exchange rate, manufacturing output was experiencing a continuous decline. This pattern of movement between exchange rate and manufacturing output shows that there is a negative relationship between them but other factors aside exchange rate affect the fluctuation of manufacturing output.

2. In the second graphical illustration, the trend between lending rate and manufacturing output can be seen as one with insignificant effect on the other, as the lending interest rate insignificantly affect manufacturing output. That is an increase in the lending interest rate has little or no effect on manufacturing output, this implies that during the time period under review lending rate does not sufficiently affect and determine manufacturing output but includes other factors inherent in the economy.

3. Finally, it was observed in the last graphical illustration that the trend pattern of manufacturing output and inflation rate during the period 1970 to 2018 was unstable. The unstable pattern of movement in inflation rates had an impact on manufacturing output. The periods of very high manufacturing output complimented with a low inflation rate signifying that inflation rate affects and determines the trend of manufacturing output. That is high inflation rate impedes the growth of manufacturing output which signifies a negative relationship between inflation rate and manufacturing output.

5.1 Conclusion

Since independence successive government have recognized the vital role of

industrialization in the Nigerian economy. The slow pace of industrialization in Nigeria is not due to lack of recognition of the need for industrialization but that of the political will to implement policies and programmes that can move the country forward. Therefore, the government should rise up to the challenges and assume a commanding height in the effective and efficient management of resources and implement policies to grow the Nigerian economy.

5.2 Policy Recommendations

1. Considering the role of manufacturing sector in the development of any nation, it is important for the Nigeria to formulate informed and deliberate policies that will stabilize the fluctuations of the macroeconomic variables to the actual needs of the manufacturing sector.

2. The Federal Government through the Central Bank of Nigeria should reduce interest rate to a single digit in order to stimulate production in of Manufacturing sector.

3. Provision and maintenance of critical infrastructures such as stable and uninterrupted power, good Road network, affordable Rail transportation among others. All these will reduce the high cost of doing business and will further enhance the productivity of the manufacturing firms in Nigeria.

4. Fiscal measures especially in the area of tax cut and removal of double taxation where it exists, could further stimulate t production and enhance manufacturing output in Nigeria.

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Contemporary Issues in Nigeria's External Debt and Implications for National Sovereignty



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Abstract

The imperative of public borrowing to finance development, combat natural or artificial disasters, and for other reasons is incontrovertible. The diverse traumatic experience of debt-victim nations: Spain, Mexico, Egypt, Venezuela, et cetera, which narrowly escaped total loss of national sovereignty to foreign lenders, due to debt-induced bankruptcy, have been x-rayed by literature: Magaji (2000) and Bature (2015), among others. The objectives of this paper are to examine the situation of Nigeria, vis-à-vis the nations which travelled the path of Nigeria's current adventure; and to proffer policy antidotes for averting the highly probable cataclysm which unsustainable external debt might precipitate, particularly against the backdrop of prevailing public apprehension. Adopting expository analytical methodology, the paper concluded that external borrowing is necessary in highly inevitable circumstances, matched with debt management profundity, in order to avert an experience similar to aforementioned victim-countries. Accordingly, it was recommended that Nigeria should strengthen the existing fiscal management capacity for enhanced internal revenue generation; while considering only reproductive borrowing for effective debt restraint.

Keywords: External Debt, Bankruptcy, Debt Management, National Sovereignty, Fiscal Management.

1.0 Introduction

For several reasons, nations borrow, either from the domestic market or from international market. The chief reason however, is that every nation requires more resources than are available, to generate the desired level of output for economic growth and development.

Other reasons include: to finance budget deficits, finance balance of payment deficits, stabilize economic shocks; finance unanticipated huge cost-overrun; and to finance infrastructural development, namely power, water, rail transport, etc, all of which involve humongous capital outlay. To be sure, the discrepancy between the level of available capital in less developed countries (LDCs) and advanced and developed countries (ADCs) explains the fundamental dichotomy between the growth and development of the two words (Jhingan, 2006: 27).

Upon the attainment of independence by Nigeria in 1960, as was true for many countries of LDCs, Nigerian leaders came in obvious contact with the country's poverty level and the urgent need to accelerate development. Thus, Nigeria considered various financing options, given the level of paucity of resources. One of the readily available sources of raising huge capital was external borrowing, in the light of the low capital formation, which rendered taxation unviable in the circumstance. Pre-independence, Nigeria conducted insignificant external borrowing, the last of which was in 1958, to finance the extension of the rail line to Bornu (Fasipe, 1990: 17).

After 1960, the Federal Government of Nigeria (FGN) established a legal framework for external borrowing with the enactment of Government Promissory Notes Ordinance, followed by the External Loans Act, 1962. The Act provided for the raising of offshore loans in such manners so authorized by the General Loans and Stock Act or Government Promissory Notes Act, 1960 (Falegan, 1992: 18). Specifically, the Act provided that external loans taken shall be used for development programmes. Unfortunately however, the application or misapplication of loan proceeds has remained a source of worry in the polity, against the backdrop of the implications of foreign debt burden and crisis, when external loans are improperly managed. Aluko and Arowolo (2010:11) expressed serious misgiving about the tendency of a borrowing government to misappropriate loan proceeds which are often diverted for other purposes, even when the loan purposes were stated as developmental. Equally worrisome was the unclear and secretive procedures for the procurement and management of the loans (Falegan, 1992: 19).

Given the background of government's approach and attitude to the conduct of the otherwise very risky external loans procured from official and unofficial sources, Nigeria was headed for protracted debt crises, which was exacerbated by the down-turn in the international oil market, and the resulted shocks from the mid-1980s. A combination of moral suasion and economic diplomacy secured the much needed relief for Nigeria by 2005 when Dr (Mrs) Ngozi Okonjo, Honourable Minister of Finance, latching on to the relationship with the World Bank Group (WBG), facilitated debt forgiveness, during

the administration of Chief Olusegun Obasanjo as President of Nigeria.

The succour was enjoyed by Nigeria during the administrations of Presidents Umaru Yar'Adua and Dr. Goodluck Jonathan; although the latter President regenerated borrowing. Citing various reasons, major of which was economic revival, the administration of President Muhammadu Buhari accelerated the velocity of foreign loan procurement, bringing the level to \$33.34 billion by the close of 2020, from \$3.65 billion attempts in 2016 (Debt Management Office, 2020).

This paper contends that in order to leapfrog the conundrum of huge external debt over the danger it portends, the impetus in terms of public opinion and academic pressure on governmental borrowing authorities must be sustained and indeed, increased. This necessary but inadequate advocacy required to moderate external borrowing has created a pressure gap. This study is motivated by the imperative of bridging the gap.

In the circumstance, the view canvassed is that accumulation of unsustainable external debt is a harbinger of economic, social and political risk, notwithstanding the borrowing purpose and imperative. In extreme progression, Nigeria's exposure to imperialism may approximate the experience of Spain, Venezuela, Mexico, etc (Magaji, 2000: 40-41).

Flowing from the problem statement, the major objective of this study is to "examine" the experience of past victim-countries of unsustainable external debt, in order to

predict the destination of Nigeria's external debt policy. Other objectives are to examine alternative financing modes; and to proffer antidotes for avoiding the pitfall of a debt crisis.

2.0 Review of Literature and Theoretical Framework

2.1 Conceptual Review

For guide, a clarification of the major concepts employed is made. The concepts include public external debt (or foreign debt, or foreign loan, or foreign borrowing), over-borrowing, debt-overhang and external debt crisis.

2.2 Public External Debt

Several authors: Okonjo-Iweala (2003:12), Fasipe, (1990: ix), Magaji(2000: 37) and Falegan (1992: 3) have provided various definitions of public external debt. Because all definitions are agreed on the precise ingredients of public external debt, the definition commonly provided by Fasipe (1990) and Falegan (1992) is adopted. Accordingly external debt is defined as external obligation of a public sector or an agency of either an autonomous public sector that has an original or external maturity of more than one year that is owed to nonresidents and repayable in foreign currency. Central to the definition are the nature of the creditors and the currency of repayment. To be sure, creditors are confident about the borrowing countries; while repayment is in foreign currency, since a foreign loan is often disbursed in foreign currency. The latter feature places enormous obligation on a borrowing LDC to generate adequate foreign exchange, without which repayment effort maybe impaired. With

regard to purpose, a commonly cited reason by borrowing LDCs is financing of infrastructural development. In every case, foreign borrowing exposes debtor to risks associated with interest overhang and general repayment difficulties. Literature is replete with rutilant experience of external borrowing by LDCs of Africa and Latin America, as presented subsequently.

2.3 Over-Borrowing

External debt management covers the gamut of policy framework directed at altering the stock, composition and terms of debt, with a view to maintaining, at any given time, a sustainable level of debt service payment. It involves the planned acquisition, deployment and retirement of external loans drawn either for developmental purposes, or for balance of payments accommodation (Ojo, 1997: 21). The key function traverses policy, regulation, recording, analysis, control and operation. Several factors interplay in analyzing external debt sustainability, to wit, whether or not a country will be able to service external debt or otherwise: existing debt stock and associated debt service, the path of the country's deficits, financing mix of the debt, and the repayment capacity with regard to the foreign currency value of gross domestic product (GDP), exports and government revenue (Abrego, 2001:42).

Economists have developed several indicators to measure debt burden and the sustainability. Among the myriad of indicators, the commonly used percentage ratios include debt stock/export, debt service/GDP, debt stock/GDP, reserves/import and reserves/debt stock. Each ratio is compared to a pre-set statistical

bench mark, for decision-making purposes (Abrego & Ross, 2001: 21). The concept of over borrowing thus refers to a situation in which a country's existing debt stock compares unfavourably with the established benchmarks. Notwithstanding the guide provided by indicators, critics have often cautioned against the wholesale application of indicators, particularly by LDCs, Nigeria inclusive, given the volatility of the economies.

2.4 Debt-Overhang

A related concept to over-borrowing, debt-overhang is the phenomenon in which external debt causes have effect on investment, making it difficult for a debtor-country to benefit fully from any increase in productivity, because part of the production goes to creditor-countries for debt service. In public finance literature, it is explained that a sovereign government services debt by taxing firms and households. A direct proportional relationship therefore exists between debt level and private sector's expected tax burden (Krugman, 1989:24).

Among the effects, debt overhang acts as a disincentive to current investment, because investors think that proceeds of new projects will be taxed away to service the pre-existing debt. With regard to public debt, the burden might be so huge that the prospects of sustainability are relatively minimal. If trapped in debt overhang, a country would have no net resource flow, since, by definition, any new loan would fall below the nominal value; and therefore, no new creditor would be willing to extend a loan, when a loss is certain.

2.5 External Debt Crisis.

The consequences of over-borrowing and

debt overhang are serious, whether for LDCs or ADCs. In particular, the problems are exacerbated in LDCs of Africa, Nigeria inclusive, and Latin America countries, because of low-domestic savings, low foreign exchange earnings, fiscal deficits and discouraged direct foreign-investment (DFI), all retarding the rate and level of economic development (Adebayo, 1990:28).

Given the foregoing background, external debt crisis is a situation in which a debtor-country is unable to meet debt service obligations, resulting in threat or actual sanction by creditors. Nigeria was enmeshed in debt conundrum, until in 2005, when reprieve was granted through debt forgiveness (Sobowale, 2018:26).

The threats Nigeria faced during the debt crisis included diminished capacity of the economy to achieve substantial growth and development, since between 70-90 per cent of export earnings was required, if full debt service was to be effected (James, 2009:11); external control and manipulation of the domestic economy by Western capital institutions, notably IMF and World Bank; external dependency; and diminished inflow of DFI, among others.

2.6 Sovereignty

Harold Laski (2008:50) in describing the nature of sovereignty posited that a state is sovereign to the extent that it does not obey any higher authority. Thus, in an independent community as a state, sovereignty is determinate and absolute. In a political sense, the authority is "illimitable, because if it could be restrained to act, it would cease to be supreme, since it would then be subject to constraining power" (Laski, 2008: 50).

Laski (2008:65), however, noted that in international relations, "international government implies the organized subordination of state to an authority in which each may have a voice" (Laski, 2008: 65). In effect, Laski postulated the disappearance of state sovereignty when the matters affect the common life of peoples across borders. This limitation on sovereignty is the locus or protocol on which international lenders stand when borrower-countries become insolvent. Appadorai (2008: 48) aligned with the views of Laski (2008:50) with the note that "the modern state claims to be sovereign, to be subject to no higher authority". Without doubt, the view of Appadorai derived from the legendary statement of Austin (1790-1859) in "Province of Jurisprudence Determined" (1832), as cited in Appadorai (2004:49). The theory of sovereignty has been shaped by many contributors including Bodin, Hobbes, Rousseau, Bentham, Dicey, Grotius, Locke and Austin, among others (Laski, 2008:49).

3.0 Review of Empirical Literature

The relationship between public external debt and economic growth and development has attracted empirical efforts, particularly because of the implications for the survival of a borrowing country and the wellbeing of the citizenry. Akinlo (1991:16) analysed the effect of structural adjustment on Nigeria's external debt profile and economic growth using descriptive framework. The study categorized the factors responsible for external debt problem into domestic and foreign. Over-valued exchange rate and fiscal deficit were chief among the domestic factors; while world economic depression and interest rate adjustments by ADCs constituted the major

foreign factors. The study concluded that overvalued currency resulted in uncompetiveness for local products, leading to declining export earnings and development in Nigeria. A study conducted by Obadan (1991:22), employing descriptive methods of analysis, reported that foreign debt can increase available resources for investment by providing supplement to domestic savings and foreign exchange earnings. How much a country borrows externally depends therefore, on the total expenditure in relation to gross domestic product. As a corollary, for external borrowing to add to domestic savings and investment, such action will not impact economic growth positively. Implicitly, a country desirous of a reduction in the level of foreign debt requirement must increase the level of domestic savings so adequately as to sustain the target growth rate.

In an empirical study conducted to evaluate Nigeria's external borrowing using econometric models, Osagie and Idehai (1991:47) reported that the level of external public debt depends on the level of debt service payments, the level of government planned capital expenditure, the level of government savings and the level of balance of payments deficit on the current account. Given that increased reliance on external borrowing can relax the drive for domestic savings by government, the study suggested that government's capital expenditure to be financed by external borrowing should be limited to projects with capacity for generating sufficient foreign exchange earnings; or projects capable of saving equivalent amount of foreign exchange.

lyoha (1996:12) conducted an econometric study of debt overhang, debt reduction, investment and economic growth in Nigeria for 1980-1994. The model permitted the simulation of the effects of external debt on economic growth. Using two-stage least squares, the study found a significant debt-overhang effect and a "crowding-out" effect of external debt on investment and economic growth for the period.

A similar study by Ekpo and Egwakhide (1998:6) employed two-stage least squares technique to test the relevance of debt-overhang hypothesis in Nigeria. The approach regressed private investment on debt service payment as a percentage of export earnings, public investment, inflation rate, bank credit to private sector, terms of trade and export earnings. The result found that the coefficient of debt service ratio was negative and significant at 95 per cent. The study thus concluded that debt serving adversely affected private investment during the study period.

Ezeabasili (2011: 5) found a negative impact in the investigation of the relationship between Nigeria's external debt and economic growth during the period 1975-2006. Specifically, the study reported that a 1 per cent increase in total debt service resulted in a 0.034 per cent decrease in GDP.

Adesola (2009: 12) in a study found a hybrid results after a review and analysis of the effect of external debt service on the economic growth and development of Nigeria from 1981 to 2004. Using variables which included GDP, gross fixed capital formation and annual debt service, analysed with OLS multiple

regression model, the results of the test showed a significant relationship between GDP at current market prices and external debt service. The study concluded, under a mixed outcome, that debt payments affected economic growth both positively and negatively.

Ahmed (2010: 26) examined the impact of the extent of external debt problem and sustainability on governments effort at reducing poverty, sustainable growth and peace in Sudan, using per capita income-growth model, a proxy of growth and development in low income countries. The results indicated that huge amounts of external debt could reduce the growth rate per capita income considerably. The results confirmed the debt overhang hypothesis in Sudan's external debt.

Contrary to the widely reported negative relationship between external debt and economic growth, some studies found no significant effects. In this wise, Ogunmuyiwa (2011:10) examined the effect of external debt on economic growth in LDCs, with Nigeria as case study. The study revealed no existence of causality between external debt and economic growth. It was thus concluded that external debt could not be employed to forecast improvement or slowdown in economic growth in Nigeria.

Overseas, studies conducted on poor and heavily indebted countries of Africa and Latin America: Zambia, Sierra Leon, Venezuela, Peru, Philippines, Argentina, Mexico, Egypt, etc, by Desphade (1990:15) using OLS method reported a negative but robust relationship between investment and external

debt. Similarly, on Pakistan, Ahmed and Shakur (2011: 10) examined the problem of external debt and economic growth, using time series data for 1981-2008. The study concluded that the growth rate of GDP per capita had negative relationship with external debt, population growth and trade openness, but a positive relationship with investment. The review of empirical studies revealed the existence of a range of arguments for and against the existence of causality between external debt and economic growth. However, the preponderance of evidence and opinions from studies and leading literature is inductive of the widely supported view that high external debt can be injurious to economic growth, since the large proportion of available national earnings must be channeled to debt service, to the detriment of investment. Subsequent analysis of country-experience relates to this assertion.

4.0 Theoretical Framework

The need to exercise great caution when making a public decision to borrow from foreign sources, and indeed to borrow at all, is premised on the maximum likelihood of loss of economic and political sovereignty by a defaulting debtor-country, if debt service becomes unsustainable, as noted in the experience of the reviewed countries. The alteration in international relationship status quo from partnership to dependency between the debt contracting countries can be explained by dependency which can manifest inadvertently in the economic relations between countries in such situations. Accordingly, a suite of dependency theory and doctrine of sovereignty underpin this study.

Dependency theory was chiefly propounded by Andre Gunder Frank, one of the most celebrated dependency theorists. Frank (1972:1) noted that there was a development of underdevelopment outside of Western Europe, North America and Japan as a consequence of emerging relationship among politico-economic formations which were brought into being as capitalism grew. The particular process of the approach lies in its view of underdevelopment as a product of domination of one national economy (the LDC) by another (the ADC).

In its applicability therefore, dependency theoretical proposition exposes the historical development of capitalism and its covert holistic domination of the third world variously actualised through strangulating economic, social and political ties, including debt 'patronage, among others. Thus, the utility of dependency theory in this paper is the relevance in explaining the source, nature and implication of amassing unsustainable external debt; and the possible national sovereignty and wellbeing of the citizen.

Developed by John Locke (1632-1704) and Jean Jacques Rousseau (1712-1778), sovereignty is the supreme power of a state, irrespective of the configuration (Habu, 2018:47). The importance of sovereignty brings to the fore the need for a state to exercise absolute authority over its own affairs, with every degree of freedom from external authority, except where the voluntarily accepts such authority.

Hinsley (1986), cited in Habu (2018: 48), viewed sovereignty as connoting that there is a final and absolute authority in a political community, provided that no final and

absolute authority exists elsewhere, Habu (2018:48) noted that notwithstanding absoluteness, "international financial institutions such as World Bank and IMF, coerce emerging countries to change decisions, to suit certain interests". Given that borrowing nations pledge sovereignty as the primary "security" to lenders, it is discernable that in extreme situations, insolvent borrower-nations are exposed to grave risk of loss of sovereignty.

Country Experience of External Debt Crisis Spain

In 16th century through 17th century, Spain became the first written account of monumental threat of external debt to the economic and political sovereignty of any country in the World (Magaji, 2000). Spain took foreign loans from several creditors, notably Germany and Dutch investors from 1568, for the purpose of financing acquisition of military forces against France and the Othoman Empire. Due to a fall in revenue and high interest charges, in excess of 40 per cent, Spain defaulted in repayment, having declared a state of bankruptcy in 1596. Eventually, the major creditors deployed force to recover from Spain. In the over 100 years of bitter war, Spain lost economic independence. To be sure, Spain utilised borrowed money to prosecute a war. Clearly, the purpose and source of repayment were incapable of liquidating the loan, particularly because economic development could not be achieved thereby. Thus, the loan deteriorated into deadweight.

Mexico

Mexico had borrowed hugely from France, England and Spain. However, due to severe

economic hardship, the country suspended repayment from 1861. Because the loan purpose was unviable, debt service was unassured.

A military expedition of the creditor-countries invaded Mexico in 1861, to recover the outstanding on the loan. Although England and Spain accepted a cease fire situation upon Mexican government accepting the indebtedness, France insisted otherwise. Consequently, France successfully installed the country's puppet as Emperor, by coercing Mexican Assembly to implement the decision. French Army however withdrew from Mexico upon the intervention of United States of America in 1866 (Landes, 1937:26). Thus, Mexico's indiscretion led to the country's loss of economic and political sovereignty.

Venezuela

Aluko (1996:13) wrote on how Venezuela was trapped in external debt quagmire. From Germany, Venezuela obtained a loan to finance some railway projects. During the civil war in Venezuela, German firms, Italian equipment and British assets suffered severe destructions. All the affected countries demanded huge compensations.

The development placed Venezuela in a precarious situation, including inability to complete the railway project, the major source of loan repayment and payment of compensations. Provoked by the situation, the creditors and war victims attacked Venezuela warships in 1902. Besides, severe blockade was erected against Venezuela by the affected countries. In 1903, Venezuela accepted to repay the loans and

compensations, following which the sanctions were lifted (Aluko, 1996:13). In effect, the procurement and deployment of external loans yielded no economic development in the circumstance.

Turkey

Loans procured from English and French banks in 1875 by Turkey were deployed mainly to finance general administration (Aluko, 1996:16). Due to the prolonged wars Turkey fought against Serbia and Montenegro in 1876, Russia in 1877, and the bid to check the insurgence of Bosnia Province, the already weakening economic condition of Turkey was aggravated. Consequently, Turkey declared a bankruptcy. By 1878, Turkey surrendered the country's independence in all economic affairs. In the circumstance, the Berlin Congress suggested that an international agency nominated by the governments of Australia, France, Italy, Holland and Germany should be established, to manage debt servicing in Turkey.

Egypt

Mohammed Ali, leader of Egypt, embarked on a modernization policy that required huge funding. Consequently, the leader indebted Egypt hugely to financial institutions in France, Britain, Australia and Italy and mortgaged Egypt's public revenue to the creditors for a period of 10 years (Aluko, 1996:15).

Ali's successor, Ismail, was coerced to endorse an agreement for instituting a debt management arrangement, to be controlled by international representatives from the debtor countries. Under the agreement, 60 per cent of Egypt's annual budget was

pledged to the creditor-banks. Besides, the Sultan of Turkey was mandated to remove Ismail, to be replaced with a puppet, Tanifik Egypt was then under Turkey Empire. With the completion of the substitution process, Egypt came under the control of the creditors. Following the development, internal uprisings were experienced in Egypt in 1881 and 1882, prompting British military intervention. The consequent loss of economic and political sovereignty to British suzerainty remained until 1952, when Egypt regained independence. During the period of loss of sovereignty, economic development was put in abeyance. In conclusion, Egypt's adventure into foreign capital financing resulted not in development but in foreign interference by lenders.

Devastating experience in foreign borrowing abound across the globe, both in historical and in contemporary parlance. Elsewhere, in Indonesia, Pakistan, Liberia, Morocco, etc, the excruciating consequences of improper external debt management, and the devastating effect on growth and development, have been reported, detailed examination of which is inexpedient in this review, due to space constraint. What is important is that external borrowing has been a mix-bag of success and adversity. The tendency is however skewed more towards unrewarding experience, particularly in LDCs, where the requisite legal, institutional and human capacities in debt management are undeveloped.

Nigeria's External Debt

The situation of Nigeria's mounting external debt has been worrisome over the past decades. Smarting from the period of oil

boom in the late 1970s, through the 1980s, Nigeria had no cause to worry about external debt or the burden. To be sure, Nigeria prosecuted the 1967-1970 Civil War without borrowing, be it from domestic or external sources, the humongous cost notwithstanding.

With the downturn in the fortunes of oil industry in the 1980s, ascribable to falling prices in international market, the fortunes of Nigeria as a wealthy nation declined. One of the consequences of the dwindling oil proceeds was the emergence of deficit budgeting.

Irrespective of the dwindling revenue conditions, government has remained determined to sustain the developmental

strides, initiated during the boom period. The contradiction inherent in the paucity of funds and desire for rapid development dichotomy necessitated a radical rethink and rework of the extant fiscal arrangement. Thus, the first external loan of N2.8billion was procured by the Federal Military Government of Nigeria (FMGN) (Falegan, 1992:93; Sobowale, 2018:26), during the military regime, 1976-1979.

Prompted by the borrowing precedent, the successor civilian administration, which assumed office in 1979, stood on the existing protocol and borrowed from the international market, to cushion the effect of the sliding oil prices: from \$25 per barrel to \$10 barrel; and further down to \$9.9 per barrel (Sobowale, 2018:27) in the early 1980s.

The upward trajectory of external borrowing of successive administrations is depicted in Table 1.

Table 1: Nigeria's External Debt Profile, 2005-2020 (\$million)

Year	Debt Stock
2005	20,477.97
2006	3,544.21
2007	3,654.21
2008	3,720.36
2009	3,863.93
2010	4,534.19
2011	5,666.58
2012	6,527.07
2013	7,554.26
2014	9,711.44
2015	10,718.43
2016	11,406.27
2017	18,913.44
2018	25,274.36
2019	27,676.14
2020	33,348.08

Sources: Debt Management Office (DMO), Nigeria, www.dmo.gov.ng

A perusal of Table 1 indicates that Nigeria's external debt stock, which stood at \$20.48 billion in 2005, plummeted to a low of \$3.54 billion by 2006, due to the forbearance granted by creditors in 2005. The stock was sustained at the moderately low single-digit level, averaging \$5.56 billion annually during the nine-year period, 2006-2014.

The trajectory, indicated subsequent accelerated growth in the debt stock from 2015, when the level attained a double digit mark. Thus, the stock assumed a steady rise through \$11.41 billion (2016), \$18.91 billion (2017), \$22.07 billion (2018), \$27.68 billion (2019) to \$33.35 billion (2020), as shown by statistics from DMO for the respective years.

In addition to the developmental need to borrow, the escalation in external debt stock from 2015 had been compelled by more recent exigencies in Nigeria's economic and social environment. The challenges vary from dwindling earnings from crude export, due to several factors, including unfavourable conditions in the international oil-markets, crude oil theft, pipeline vandalism, pervasive insecurity and Corona Virus (COVID-19) pandemic, all of which rendered recourse to taxation, particularly under such emergencies, inefficacious. Thus, external borrowing became the most readily available and effective stand-by plan, in the rather tight situation. For certain, the duo of insecurity and COVID-19 pandemic had rapidly inflicted irreparable depletion in human and capital stocks of Nigeria. As it is, to save the lives and property of citizens remains the primary responsibility of government. Policies and actions to achieve this objective must therefore be accorded a first-line charge on

national resources. On this note, it might be illogical to over-emphasize the irrationality of amassing huge public external debt as widely posited.

Notwithstanding the logic of the argument to have borrowed hugely, particularly from 2015, it suffices to note that foreign debts are a harbinger of external mortgage, including dependence; and in severe circumstances, total imperialism, as noted in the experience of the reviewed countries. For these fears, government must remain restless, when the citizens, who must repay via taxes and other compulsions are restive, because of the future danger portended by today's decision, action or inaction of government.

The Future Nigeria Under Unsustainable External Debt.

In deciding at what level public debt, whether domestic or external, has become so huge as to become unsustainable, economists often resort to the use of pre-set ratios as benchmarks for comparison, as earlier highlighted. A commonly deployed argument advanced by Nigerian government through public financial authorities (Federal Ministry of Finance and Budget and DMO) is that Nigeria's debt to GDP ratio at current rate of 21 percent, when compared with the acceptable 40 percent, is tolerable. However, critics of over-reliance on ratio approach, mainly public analysts, posit that while ratios maybe interesting 'financial simulations', based on historical results, debt service is met from earned cash. If therefore the size of a borrower-country's GDP is a trillion dollars, but the country is unable to earn foreign exchange adequate to service existing debt obligation, the large GDP size may be

ineffectual, with respect to debt service. For this reason, it has been generally argued that Nigeria's current foreign exchange earnings capacity should be the cardinal yardsticks for gauging the country's debt service capacity.

In any case, problem arises when a significant variance is experienced between actual and expected earnings. If the variability is significant and transient, because the cause is easily reversible, the shock may be temporary and mildly devastating. If however, fundamental or structural adjustments are required, the plight might be traumatic and enduring.

Arising from the foregoing therefore, it is surmised that Nigeria's external debt could crystallize in economic and social situations characterized by over borrowing, debt overhang and debt crises, all of which are reminiscent of pre-2005 era. The situation may be exacerbated if the prevailing security challenge progressed unabated; or if it escalated. As it is, the security apparatuses, particularly the Armed Forces, are rationally ever requesting for additional weapons, platforms and personnel. It is trite knowledge that all military hardware's are acquired with foreign currencies, just as maintenance is effected in the same medium of exchange.

While grappling to meet existing debt obligations, government is also compelled to meet current demands. Unless much profundity in debt management is acquired or developed, the debt situation might snowball into a vicious circle, with limited opportunity for immediate exit.

Managing COVID-19 quagmire requires huge resources: to acquire vaccines, pay the newly enhanced emoluments of health

workers, provide palliatives during lockdowns, provide mediation and medical equipment to isolation and health centres and enforce safety protocols, among other imperatives.

These exigencies created by COVID-19 and the hike in insecurity alone are capable of derailing all financial plans contemplated by any weak emerging economy, as Nigeria. When hydra-headed corruption is factored into the equation, the damaging effect of the conspiracy (insecurity, COVID-19 and corruption) becomes monumental.

Arising from the analysis, several findings were made, salient of which include the following:

1. Nigeria's external debt stock has witnessed a steady growth, with a major leap during the period 2015-2020.
2. Beyond the imperative of development, the exigencies of escalated insecurity and COVID-19 epidemic exacerbated the situation that propelled the inexorability of external borrowing, in the face of huge deficits in taxation alternative.
3. Irrespective of the rationality and any justification for the public policy on external debt financing mode, it is surmised that Nigeria might be risking a second wave of unsustainable debt situation, after the forbearance in 2005. The survivability of the attendant crises will depend on to Friday Shirras, in Jhingan (2008)'s admonition, that countries should at all times only procure "productive loans which are fully covered by assets of equal or greater value and the sources of the interest is income from the ownership of these, such as railways and irrigation works".

4. There is a likelihood that unless prudence or profundity is observed in external debt management, a crisis situation which could progress to undesirable vicious circle of imperialism would crystallize.

Naturally, any severe adverse economic condition is a harbinger of social discomfort, restiveness and unrest. If an economic doldrum emerged from the adverse effect of the conspiracy aforesaid, the effect would naturally exacerbate the existing social disorder: armed robbery, banditry, cybercrime, prostitution, brigandage, drug abuse, urbanization and the attendant crime, etc, to compound the prevailing situation.

As a corollary to the development in the economic and social sectors, the political sector might be challenged: political wrangling within the elite political class, non-observance of rule of law in the conduct of government affairs, and at times, political instability. The subsequent section proposes recommended policy antidotes for addressing the identified challenges.

5.0 Conclusion and Policy Recommendations

That the volume of Nigeria's external debt has experienced considerable increase, particularly in the last six years, is a statement of fact. However, the extenuating circumstances which compelled government's policy stand clearly as 'grounds of defence', atleast in the court of the public. Nevertheless, creditors often expect, logically, that as and when due, debt obligations should be met, the circumstances of the borrower notwithstanding. Anything, legal and moral, which can address or

ameliorate the key underlying issues in Nigeria's high propensity to borrow externally must be profoundly, dutifully and expeditiously addressed.

To avert any unpleasant economic, social and political cataclysm therefore, the following policy antidotes have been proffered: Government should tackle the raging insecurity with all possible arsenals. Political or economic interests, if any, should be excoriated from all military planning, strategy and execution, in order to remove the latent clog in the wheel of effectiveness. To do otherwise is to prolong the insecurity period, with the attendant huge cost, loss of lives and property.

While agreeing that COVID-19 is an uncontrived natural disaster, some negative externalities relating to the prosecution have been widely reported. In this regard, the disaster might have turned the plight of the citizenry's economic misfortune into opportunities to some stakeholders, in furtherance of the endemic corruption in Nigeria. The allegations and counter allegations in the media, with respect to the management of the palliatives provided by the Private Sector Coalition Against COVID-19 (CACOVID-19), and distribution of cash and material palliatives among vulnerable Nigerians, remain fresh in memories.

Government should rejig the existing apparatus for fighting corruption so as to strengthen the effectiveness for rapid results. That cost of governance in Nigeria, which has been declared as overly huge, was acknowledged by government, through the Minister of Finance's announcement of a

huge jump from about N3.7 trillion to about N7.5 trillion in one year (2020-2021). The situation is uneconomical and inefficient. Such a phenomenon can only fuel public suspicion that government borrows to fund ostentatious consumption by the political apparatchiks and top brass of public service. Government should drastically cut cost at all levels, in order to free financial resources for needs of urgent importance.

A creditor receiving the information about such huge allocations for high life will certainly be unwilling to consider any request for debt relief.

Transparency International may also rely on such information from credible sources as valuable impute in transparency assessment.

Above all, government should diversify the earnings base of Nigeria's economy; because over-dependence on the single oil source has become overly dangerous to the health and growth of Nigeria economy.

In this wise, government should strengthen the revenue generating apparatuses, by considering widening the tax net and rejigging the collection agencies. Deployment of e-government and stricter enforcement of tax compliance should be institutionalized, to boost revenue collections.

Very important too, government should conduct public public debt management with a high degree of caution in view of the danger which poor debt management portends for an insolvent or bankrupt nation.

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External Sector Liberalization and Output Growth in Nigeria



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Abstract

The paper investigates the impact of external sector liberalization (foreign direct investment, external debt stock, trade openness and exchange rate) on the output growth in Nigeria from the period 1981 to 2019, utilizing correlation analysis, Granger causality test and vector autoregression (VAR). The results indicate that foreign direct investment, external debt stock, trade openness and exchange rate all correlate positively with gross domestic product. Also, the granger causality test indicates that foreign direct investment, trade openness and exchange rate granger cause the output growth in Nigeria. From the VAR result foreign direct investment exerted positive and significant impact on the output growth in Nigeria. The paper thus recommended the formulation of an admixture of fiscal and monetary policy, including harmonized foreign exchange policy, to ensure stable macroeconomic environment that will attract foreign direct investment, especially into the tradeable sector that holds higher potential for output growth.

Keywords: External debt stock, Foreign direct investment, Nigeria, Trade openness, VAR.

JEL Classification: C13; C22; O47; F41; F43; F22

1.0 Introduction

The Nigerian economy is largely dependent on the rest of the world. This has necessitated her participation in some regional / international economic organizations including the Economic Community of West African States (ECOWAS), Africa Free Trade Area, and the World Trade Organization (WTO). The country's activities with the rest of the world therefore constitutes her international transactions which represent the external sector. These transactions take the form of "imports, exports, capital accounts inflows, capital accounts outflow, etc., with the rest of the world and are recorded in the form of accounts which shows the contribution of external sector" (Shah and Fazal, 2016).

Nigeria being an open economy, from time to time experiences some degree of external shocks with attendant pressure on the domestic economy. Such pressures come from various sources including trade, capital flows, currency exchange rate, and external debts.

Scholars including Edward (1990) and Quinn (1997) have observed that the external sector, have significant effect on economic growth. Some follow-up studies in the in the early 2000s (Chanda, 2000; and Donell, 2001) have reported that economic growth is not significantly influenced by the external sector. Although Ghosal (2012) supported the later findings, the effects were disaggregated into short run and long run. He observed a negative long-run effect of external sector liberalization on economic growth, but a positive short-run effect. Similarly, Herzer

(2012), noted that foreign direct investment (financial liberalization) may increase capital and, therefore, production, it may also crowd-out domestic firms, so its total effect in developing countries might be negative. It has also been argued that “trade liberalization may have a negative impact on developing countries because of the increase of imports, which worsen the trade balance” (Santos-Paulino and Thirlwall, 2004) cited in Berasaluce and Romero (2016).

This lack of consensus on the effect of the external sector liberalization on the output growth forms the main motivation for this study. This study therefore seeks to empirically investigate the impact of the Nigerian external sector in propelling the growth of the economy; and to test for the direction of causality between the external sector variables and economic growth of Nigeria. In this regard, four key external sector variables – foreign direct investment, external debt stock, trade openness, and exchange rate are examined.

The study adapted the methodology employed by Nguyen (2011) on the impact of trade liberalization on Malaysian and South Korean economic growth. Econometric approach, including the Granger causality test, VAR estimates, impulse response analysis, and variance decomposition were utilized. Following this introduction, the remaining part of this paper is structured as follows: Part II comprises literature review – both theoretical and empirical, while Part III dwells on methodology. Part IV presents the findings and discussion. Part V contains conclusion and some policy recommendations.

2.0 LITERATURE REVIEW

2.1 Theoretical Literature

The theoretical underpinning of the impact of external sector on real sector of the economy can be traced to the Keynesian aggregate demand function. This function is given as follows:

$$Y=C+I+G+E \text{ ----- (1)}$$

Where Y is the output; C is private sector consumption spending; I is private sector investment spending; G is the government consumption and investment spending; and E captures the external sector.

Given equation (1), the external sector can be traced to be the tradable sector with the rest of the world. Hence,

$$E= \text{Exports} - \text{Imports} (E_x - I_m) \text{ ----- (2)}$$

Incorporating Equation (2) into Equation (1),

$$Y=C+I+G+(E_x - I_m) \text{ ----- (3)}$$

Equation (3) defines the fact that the aggregate output of an economy is also defined by external factors through net exports. Thus, external sector shocks that will cause exports to be greater than imports will lead to a positive net export, leading an increase in aggregate output. Similarly, an external sector shock that will cause imports to be greater than exports will give rise to a negative net export, culminating to a decline in the aggregate output of the economy.

2.2 Empirical Literature

Berasaluce and Romero (2017) investigated the relationship between the external sector variables (exports, imports and foreign direct investment) on the growth of the economy of Korea. The study utilized the vector autoregressive model and the findings suggest that exports and foreign direct investment are not growth driven in Korea.

Therefore, caution must be made about policies that are promoting foreign direct investment and trade.

Badejo, Maku, Adelowokan and Alimi (2018) utilized data for the period 1980 to 2016 to examine the growth effects of external sector in Nigeria, taking due cognizance of the non-oil export commodities. The study employed the vector error correction mechanism to investigate both the long run and short run dynamics. Findings of the study revealed that non-oil export had a positive and significant effect at 10% in the long-run indicating a weak contribution of non-oil export commodity on output growth. The paper further revealed that "output growth was directly influenced by investment, labour force and government expenditure while negatively affected by exchange rate".

Also, Okodua and Ewetan (2013) studied the export-led growth hypothesis for the period 1970 to 2010. The Granger causality test showed that a unidirectional causality flows from gross domestic product to exports. This finding therefore rejects the export-led growth paradigm. Similarly, a unidirectional causality flowing from export to growth in the long-run was observed in Nigeria in a study conducted by Alimi, Yinusa and Ilo (2016) to ascertain the validity of the export-led growth hypothesis under the vector error correction framework.

Shah and Fazal (2016) investigated the external sector impact on the Pakistan economy using quarterly time series data for the period 1990: Q1 to 2010: Q4. The study utilized vector autoregression coupled with the vector error correction mechanism. They

observed that "financial integration has positive while trade integration has negative effect on economic growth of Pakistan in the long run; while the short run dynamics shows that output lag accounts for error correction.

In Italy, Pistoresi and Rinaldi (2011) studied the relationship between real imports, exports and output growth for the period 1863 – 2004 using the cointegration and Granger causality test techniques. The result of the data analysis showed that exports, real imports and real output have "long-run relationship while their direction of causality varies over the periods". The study concludes by stating that both export and import stimulates output growth of Italy.

In Egypt, Abou-Stait (2005) scrutinized the export led growth for the period of 1977 to 2003 by using Augmented Dickey-Fuller unit root test, Granger causality test, vector autoregression (VAR), and the impulse response function. No long run relationship was recorded between exports, imports and output. Further, the study reported a uni-directional causality running from export to output growth.

Using panel multivariate cointegrated vector autoregressive (VAR) technique, Awokuse (2007) examined how total trade influenced the growth of output in Bulgaria, Czech Republic and Poland. Findings of the study nullifies the validity of the export-led hypothesis but upheld the fact that import is the driver of growth. Also, a panel analysis on twenty-four OECD countries was carried out by Laszlo (2007) using Granger causality and Seemingly Unrelated Regression estimator to establish the relationship between real export

and output. A unidirectional causality was observed between export and output in New Zealand, Denmark, Ireland, Belgium, Sweden, Italy, Iceland, and Spain.

Other studies have been geared towards analysing the impact of trade openness and foreign direct investment on output growth. the study of Khan (2007) aimed at examining the impact of foreign direct investment on the growth rate using the Bounds test for cointegration. It was observed that foreign direct investment stimulates growth in the short run and in the long run. Similarly, Ray (2012) studied the influence of foreign direct investment on India's economic growth using the OLS approach. It was observed that a positive relationship exists between foreign direct investment and the growth of India's economy.

Also, Umme and Manni (2012) examined the impact of trade openness on Bangladesh's growth rate. The study used the OLS approach and it was realized that trade liberalization stimulates economic growth. Finally, a study by Herath (2010) on Sri Lanka was geared towards finding the causal relationship between trade openness and economic growth using multiple regression analysis. It was realized that trade liberalization has a positive relationship with economic growth of Sri Lanka.

3.0 DATA AND METHODOLOGY

3.1 Data

The data for the study were obtained from the Central Bank of Nigeria (2019) statistical bulletin and from the World Bank (2018) database on world development indicators. Data on real gross domestic product, external

debt stock, and exchange rate were obtained from the Central Bank of Nigeria while data on foreign direct investment was obtained from the World Bank database.

3.2 Theoretical Framework

With the intention of studying the dynamics of external sector variables, this study utilized the vector autoregressive (VAR) approach. This approach has been utilized by early researchers such as Aslam (2007) in Bangladesh; Ghosal (2012) in India; Shah1 and Fazal (2016) in Pakistan; and Nguyen (2011) in Malaysia and South Korea. This framework is appropriate because it has the advantage of avoiding misspecification and minimizes omitted-variables bias, while allowing for the testing and estimation of the causal relationship variables: real GDP, foreign direct investment, external debt stock, trade openness, and exchange rate, through a five-variable VAR model. (Berasaluce and Romero, 2016)

3.3 Model Specification

In examining the impact of external sector variables on real sector output in Nigeria, the model is specified as follows:

$$RGDP = f(FDIN, EXDS, TRPN, EXCR) \text{ ----- (4)}$$

Where:

RGDP = real gross domestic product Growth Rate

FDIN = foreign direct investment

TRPN = trade openness

EXCR = exchange rate.

Equation (4) is transformed into its estimable form to arrive at Equation (5).

$$RGDP_t = a_0 + a_1FDIN_t + a_2EXDS_t + a_3TRPN_t + a_4EXCR_t + u_t \text{ -----(5)}$$

Where a_0 is the intercept; a_1 to a_4 are the parameters to be estimated; and u_t is the error term.

3.4 Estimation Procedure

The techniques of analysis utilized in this study are Granger causality test and the Structural VAR approach.

3.4.1 Structural VAR

With x_t being considered as vector of variables RGDP (Real Gross Domestic Product – a proxy for economic growth), FDIN (foreign direct investment), EXDS (external debt stock), TRPN (trade openness), and EXCR (exchange rate),

$$x_{t-1} = (RGDP_{t-1}, FDIN_{t-1}, EXDS_{t-1}, TRPN_{t-1}, EXCR_{t-1}) \dots \dots \dots (7)$$

Our structural VAR model is specified as a system of equations as:

$$\begin{aligned}
 RGDP_t = & \beta_{10} - \beta_{11}FDIN_t - \beta_{12}EXDS_t - \beta_{13}TRPN_t - \beta_{14}EXCR_t + \sum_{i=0}^n \gamma_{11}EXCR_{t-i} \\
 & + \sum_{i=0}^n \gamma_{12}FDIN_{t-i} + \sum_{i=0}^n \gamma_{13}EXDS_{t-i} + \sum_{i=0}^n \gamma_{14}TRPN_{t-i} + \sum_{i=0}^n \gamma_{15}RGDP_{t-i} \\
 & + \mu_{1t} \quad (8)
 \end{aligned}$$

$$\begin{aligned}
 FDIN_t = & \beta_{20} - \beta_{21}RGDP_t - \beta_{22}EXDS_t - \beta_{23}TRPN_t - \beta_{24}EXCR_t + \sum_{i=0}^n \gamma_{21}EXCR_{t-1} \\
 & + \sum_{i=0}^n \gamma_{22}FDIN_{t-i} + \sum_{i=0}^n \gamma_{23}EXDS_{t-i} + \sum_{i=0}^n \gamma_{24}TRPN_{t-i} + \sum_{i=0}^n \gamma_{25}RGDP_{t-i} \\
 & + \mu_{2t} \quad (9)
 \end{aligned}$$

$$\begin{aligned}
 EXDS_t = & \beta_{30} - \beta_{31}TRPN_t - \beta_{32}EXCR_t - \beta_{33}RGDP_t - \beta_{34}FDIN_t + \sum_{i=0}^n \gamma_{31}EXCR_{t-i} \\
 & + \sum_{i=0}^n \gamma_{32}FDIN_{t-i} + \sum_{i=0}^n \gamma_{33}EXDS_{t-i} + \sum_{i=0}^n \gamma_{34}TRPN_{t-i} + \sum_{i=0}^n \gamma_{35}RGDP_{t-i} \\
 & + \mu_{3t} \quad (10)
 \end{aligned}$$

$$\begin{aligned}
 TRPN_t = & \beta_{40} - \beta_{41}EXCR_t - \beta_{42}EXDS_t - \beta_{43}FDIN_t - \beta_{44}RGDP_t + \sum_{i=0}^n \gamma_{41}EXCR_{t-i} \\
 TRP_t = & \beta_{40} - \beta_{41}EXCR_t - \beta_{42}EXDS_t - \beta_{43}FDIN_t - \beta_{44}RGDP_t + \sum_{i=0}^n \gamma_{41}EXCR_{t-i} \\
 & + \sum_{i=0}^n \gamma_{42}FDIN_{t-i} + \sum_{i=0}^n \gamma_{43}EXDS_{t-i} + \sum_{i=0}^n \gamma_{44}TRPN_{t-i} + \sum_{i=0}^n \gamma_{45}RGDP_{t-i} \\
 & + \mu_{4t} \quad (11)
 \end{aligned}$$

$$\begin{aligned}
 EXCR_t = & \beta_{50} - \beta_{51}RGDP_t - \beta_{52}FDIN_t - \beta_{53}EXDS_t - \beta_{54}TRPN_t + \sum_{i=0}^n \gamma_{51}EXCR_{t-i} \\
 & + \sum_{i=0}^n \gamma_{52}FDIN_{t-i} + \sum_{i=0}^n \gamma_{53}EXDS_{t-i} + \sum_{i=0}^n \gamma_{54}TRPN_{t-i} + \sum_{i=0}^n \gamma_{55}RGDP_{t-i} \\
 & + \mu_{5t} \quad (12)
 \end{aligned}$$

where β is the vector of the coefficient of variable; β_0 is the vector of the intercept; γ is the vector coefficient of lag dependent and independent variables; and μ is the error term.

Where β is the vector of the coefficient of variable; β_0 is the vector of the intercept; γ is the vector of coefficient of lag dependent and independent variables; and μ is the error term.

3.4.2 Granger Causality Test

We specify the model for the Granger causality test to trace the nature of the relationship between external sector variables and the real sector output. The

model is specified as follows.

$$\begin{cases}
 y_t = \sum_{k=1}^k \beta_1 y_{t-1} + \sum_{k=1}^k \beta_2 x_{t-1} + \epsilon_t \\
 x_t = \sum_{k=1}^k \beta_1 x_{t-1} + \sum_{k=1}^k \beta_2 y_{t-1} + \epsilon_t
 \end{cases} \dots \dots (13)$$

Where k is the lag order; t is the time period; while γ_t and χ_t are the variables to be tested for the existence of causality. The estimation of Equation (13) yields F-statistics which are used to carry out the test. The test yields three scenarios: unidirectional causality – where either γ_t causes χ_t or χ_t causes γ_t bidirectional

causality – where both γ_t and χ_t causes each other; and no causality – where neither of the variables causes each other.

captures both the measures of central tendency (mean and median) along with the measures of dispersion or variability (standard deviation). The result is presented in Table 1.

4.0 RESULTS AND DISCUSSION

4.1 Descriptive Statistics

The descriptive statistics of the variables

	RGDP	FDIN	EXDS	TRPN	EXCR
Mean	34690.67	2.78E+09	1698.21	16.95	94.14
Median	23688.28	1.87E+09	633.14	11.25	101.70
Maximum	71387.83	8.84E+09	9022.42	56.53	306.93
Minimum	13779.26	1.89E+08	2.33	0.10	0.62
Standard Deviation	20237.78	2.55E+09	2195.77	16.68	92.82
Observations	39	39	39	39	39

Source: Output Extracted from EViews 10 Software Package

From Table 1, RGDP averaged 34,690.67 billion with a standard deviation of 20,237.78. The maximum RGDP over the study period was 71,387.83 while the minimum was 13,779.26 billion. This therefore gives the range to be 56,608.57 billion. Other variables can be interpreted in a similar manner given their statistics in the table.

4.2 Correlations Analysis

The correlation analysis is carried out to examine how each of the variables correlates with the other and to ascertain the possibility of multicollinearity in our model. Table 2 presents the correlation matrix.

Table 2: Correlation Matrix

	RGDP	FDIN	EXDS	TRPN	EXCR
RGDP	1.000				
FDIN	0.752	1.000			
EXDS	0.567	0.128	1.000		
TRPN	0.941	0.827	0.574	1.000	
EXCR	0.926	0.616	0.797	0.895	1.000

Source: Output Extracted from EViews 10 Software Package

Given the correlation matrix in Table 2, we observe that all the variables correlate positively with the dependent variable. This implies that as FDIN, EXDS, TRPN and EXCR rises, RGDP also increases. Both trade openness and exchange rate exhibit the highest degree of correlation as captured by their correlation coefficient of 0.941 and 0.926 respectively. Meanwhile, the correlation between RGDP and FDIN is also high (0.752) while that of RGDP and EXDS is fair (0.567). Foreign direct investment and

trade openness exhibits high correlation (0.827) as well as trade openness and exchange rate (0.895). All the variables correlate highly, giving rise to the correlation coefficient of 1.

4.3 Granger Causality Test

The nature of the causal relationship between external sector variables and economic growth is analysed using the Pairwise Granger causality test. This result is shown in Table 3.

Table 3: Pairwise Granger Causality Test result

Null Hypothesis:	F-Statistic	Probability	Nature of Relationship
FDIN does not Granger Cause RGDP	4.61664	0.0173**	Unidirectional causality
RGDP does not Granger Cause FDIN	1.96730	0.1564	
EXDS does not Granger Cause RGDP	0.50387	0.6089	Unidirectional causality
RGDP does not Granger Cause EXDS	5.93053	0.0064**	
TRPN does not Granger Cause RGDP	5.81113	0.0070**	Bidirectional causality
RGDP does not Granger Cause TRPN	2.80076	0.0757*	
EXCR does not Granger Cause RGDP	2.70644	0.0820*	Bidirectional causality
RGDP does not Granger Cause EXCR	3.37691	0.0467**	
EXDS does not Granger Cause FDIN	1.76423	0.1876	No causality
FDIN does not Granger Cause EXDS	0.77004	0.4714	
TRPN does not Granger Cause FDIN	3.40297	0.0457**	Unidirectional causality
FDIN does not Granger Cause TRPN	0.34576	0.7103	
EXCR does not Granger Cause FDIN	1.26991	0.2946	No causality
FDIN does not Granger Cause EXCR	0.07043	0.9321	
TRPN does not Granger Cause EXDS	2.44311	0.1029	Unidirectional causality
EXDS does not Granger Cause TRPN	5.12510	0.0117**	
EXCR does not Granger Cause EXDS	3.20396	0.0539*	Unidirectional causality
EXDS does not Granger Cause EXCR	0.49451	0.6145	
EXCR does not Granger Cause TRPN	10.7285	0.0003***	Bidirectional causality
TRPN does not Granger Cause EXCR	2.77012	0.0777*	

Note: *, ** and *** denotes significance at 10%, 5% and 1% respectively.

The result of the Granger causality test reveals that a unidirectional causality flows from (i) foreign direct investment to real gross domestic product; (ii) RGDP to external debt stock; (iii) trade openness to foreign direct investment; (iv) trade openness to external debt stock; and (v) exchange rate and external debt stock. Meanwhile, a bidirectional causality flows between trade openness and RGDP; exchange rate and RGDP; and exchange rate and trade openness. However, no causality exists between (i) external debts stock and foreign direct investment, and (ii) between exchange rate and foreign direct

investment. For the fact that some of the external sector variables exhibits a bidirectional causality with RGDP, we therefore utilized the VAR model to track the response of the variables to shocks in other variables using the Akaike Information Criteria (AIC).

4.4 Vector Autoregressive (VAR) Estimate

The VAR result is presented in Table 4 to showcase how each of the variables in the model is explained by the variation in other variables.

Table 4: Vector Autoregression Result

	RGDP	FDIN	EXDS	TRPN	EXCR
RGDP(-1)	0.9149 (0.0383) [23.8940]***	-89841.73 (44699.4) [-2.0099]	0.0179 (0.0276) [0.6486]	-0.0002 (0.0001) [-1.1556]	0.0017 (0.0007) [2.6509]*
FDIN(-1)	5.74E-07 (1.9E-07) [3.0984]**	0.4644 (0.2161) [2.1489]	-2.20E-07 (1.3E-07) [-1.6454]	7.91E-10 (6.6E-10) [1.1932]	-6.36E-11 (3.1E-09) [-0.0202]
EXDS(-1)	0.2736 (0.2668) [1.0256]	-483661.4 (311394) [-1.5532]	0.5907 (0.1925) [3.0685]**	-0.0002 (0.0001) [-0.2487]	0.0011 (0.0045) [0.2412]
TRPN(-1)	43.4936 (45.8291) [0.9490]	1.10E+08 (5.3E+07) [2.0556]	-39.4397 (33.0707) [-1.1926]	0.6310 (0.1642) [3.8439]**	-1.3234 (0.7789) [-1.6991]
EXCR(-1)	3.3293 (10.5897) [0.31439]	19064384 (1.2E+07) [1.54217]	16.9077 (7.6416) [2.2126]	0.0999 (0.0379) [2.6335]*	0.8800 (0.1799) [4.8896]**
C	1367.243 (684.895) [1.9963]	1.88E+09 (8.0E+08) [2.3526]	-14.6716 (494.226) [-0.0297]	2.0319 (2.4533) [0.8283]	-19.9161 (11.6405) [-1.7109]
R-squared	0.9982	0.8439	0.9203	0.9656	0.97496
Adj. R-squared	0.9279	0.8195	0.9078	0.9602	0.9710
F-statistic	3511.925	34.5999	73.8559	179.3740	249.1603

Note: *, ** and *** denotes significance at 10%, 5% and 1% respectively; Standard errors are enclosed in normal brackets () while the t-statistics are enclosed in square brackets [].

The VAR result, with respect to RGDP, indicate that RGDP is strongly endogenous in predicting itself since its lag value is statistically significant at 1% level. Based on the coefficient, the past realization of RGDP is associated with 0.9149% increase in RGDP ceteris paribus. Among all the external sector variables, only foreign direct investment is strongly exogenous in predicting RGDP as its t-statistic is significant at the 5% level. Thus, a unit percentage increase in FDIN is associated with a 5.74E-07% increase in RGDP. External debt stock, trade openness, and exchange rate are all weakly exogenous in predicting RGDP. We can therefore say that external sector shocks relating to foreign direct investment will have a significant impact on the growth of the Nigeria

economy. The adjusted R-squared indicates that the 92.79% of the total variations in the RGDP can be explained by variations in foreign direct investment, external debt stock, trade openness and exchange rate.

It is also observed that foreign direct investment (FDIN) is weakly endogenous in predicting itself since the coefficient of its past realization is not statistically significant. Also, all the variables are also weakly exogenous in predicting foreign direct investment. Meanwhile, 81.95% of the variations in FDIN is explained by the variations in real GDP, external debt stock, trade openness, and exchange rate.

External debt stock (EXDS) is strongly endogenous in predicting itself as its t-statistic (3.0685) is statistically significant at

the 5% level. Hence, the past realization in external debt stock is associated with 0.5907% increase in external debt stock. All other variables are weakly exogenous in predicting external debt stock. The R-squared indicates that the explanatory variables explain 90.78% of the variation in external debt stock.

Trade openness (TRPN) strongly predict itself as its t-statistic is statistically significant hence, TRPN is strongly endogenous. The implication is that the past realization in TRPN is associated with 0.6310% increase in trade openness. Also, exchange rate is statistically significant in predicting trade openness at the 5% level. Thus, a unit percentage increase in exchange rate will lead to a 0.0999% increase in trade openness. Real GDP, foreign direct investment, and external debt stock are all statistically insignificant in predicting trade openness hence, they are all weakly exogenous. From the R-squared, 96.02% of

the total variations in TRPN is accounted for by the variations in the explanatory variables.

Exchange rate is also strongly endogenous in predicting itself hence, the past realization of EXCR is associated with a 0.88% increase in exchange rate. Meanwhile, real GDP is also strongly exogenous in predicting exchange rate. Thus, a unit percentage increase in RGDP will lead to a 0.0017% increase in exchange rate. Other explanatory variables are weakly exogenous in predicting exchange rate. The R-squared indicates that 97.10% of the total variation in exchange rate is as a result of the variation in the explanatory variables.

4.5 Variance Decomposition

For the variance decomposition, we split the analysis into short run (Period 1 to Period 2) and long run (Period 3 to Period 5). The result over the five-year period is presented in Table 5.

Table 5: Variance Decomposition of the Variables

Variance Decomposition of RGDP						
Period	Standard Error	RGDP	FDIN	EXDS	TRPN	EXCR
1	928.81	100.00	0.00	0.00	0.00	0.00
2	1416.42	78.95	18.13	2.20	0.65	0.08
3	1899.10	56.46	35.13	4.24	1.51	2.66
4	2427.73	38.99	45.21	5.97	1.34	8.50
5	2998.41	27.34	48.89	7.32	0.88	15.57
Variance Decomposition of FDIN						
Period	Standard Error	RGDP	FDIN	EXDS	TRPN	EXCR
1	1.08E+09	0.33	99.67	0.00	0.00	0.00
2	1.38E+09	0.94	93.07	0.58	2.72	2.69
3	1.59E+09	1.83	87.90	0.59	3.26	6.41
4	1.75E+09	2.51	83.82	0.50	2.89	10.28
5	1.88E+09	2.91	80.36	0.44	2.53	13.76
Variance Decomposition of EXDS						
Period	Standard Error	RGDP	FDIN	EXDS	TRPN	EXCR
1	670.24	0.44	15.13	84.43	0.00	0.00
2	980.69	0.43	25.81	64.58	5.00	4.18
3	1252.59	0.35	31.66	50.32	12.58	5.10
4	1478.13	1.03	35.93	41.06	17.79	4.19
5	1653.39	2.38	39.17	35.09	20.01	3.35

Variance Decomposition of TRPN						
Period	Standard Error	RGDP	FDIN	EXDS	TRPN	EXCR
1	3.33	1.33	12.36	0.90	85.41	0.00
2	4.29	2.47	23.80	4.77	61.34	7.62
3	5.11	2.94	26.48	7.82	43.34	19.41
4	5.85	2.67	24.64	9.64	34.52	28.53
5	6.46	2.21	21.84	10.63	31.74	33.58
Variance Decomposition of EXCR						
Period	Standard Error	RGDP	FDIN	EXDS	TRPN	EXCR
1	15.79	2.04	0.26	27.70	13.52	56.48
2	22.39	1.02	0.41	25.20	23.53	49.84
3	26.76	1.40	1.40	23.36	30.25	43.59
4	29.65	2.88	2.57	22.13	33.92	38.51

Source: Output Extracted from EViews 10 Software Package.

For RGDP, the short run period is characterized by the forecasted error variance being explained by RGDP itself amounting to 78.95 percent in the second period. This further prove that RGDP is strongly endogenous in predicting itself in the short run. But in the long run, we observed that foreign direct investment also played a crucial role in explaining the forecasted error variance in RGDP. FDIN explained up to 48.89 percent along with exchange rate explaining about 15.57 per cent of the forecasted error variance in RGDP. In the long run, RGDP seems to be weakly endogenous with just 27.34 per cent of the forecasted error variance being explained by itself; while foreign direct investment is strongly exogenous in predicting RGDP. Meanwhile, external debt stock and trade openness remains weakly exogenous in explaining RGDP both in the short run and in the long run.

With respect to foreign direct investment (FDIN), the variable remains strongly endogenous in predicting itself both in the short term and in the long term, explaining up to 80.36 per cent of its forecasted error variance in the long run. Though exchange

rate showed some degree of influence in the long run by explaining up to 13.76 percent of the forecasted error variance in FDIN, other variables remain weakly exogenous in predicting FDIN.

External debt stock (EXDS) explains about 84.43 percent of its forecasted error variance in the short run, implying that the variable was strongly endogenous, but such influence diminishes in the long term since the variable was only able to predict about 35.09 per cent of its forecasted error variance. Variables like foreign direct investment and trade openness exhibit strong exogeneity in predicting EXDS as they jointly explain about 59.18 of the forecasted error variances, with foreign direct investment explaining 39.17 percent while trade openness explained 20.01 percent. Foreign direct investment and trade openness therefore becomes strongly exogenous in predicting EXDS in the long run but were weakly exogenous along with exchange rate and RGDP in the short run.

Trade openness (TRPN) exhibits strong endogeneity in the short term by explaining about 85.41 per cent of its forecasted error variance in the short run but its effect diminished in the long run as it was only able

to explain only 35.29 percent of its forecasted error variance. Foreign direct investment, external debt stock, and exchange rate gained long term momentum in predicting TRPN. FDIN explained about 21.84 per cent of the forecasted error variance in TRPN; external debt stock explained about 10.63 per cent; while exchange rate explained 33.58 percent. Over all, the three variables jointly explain 66.05 per cent of the forecasted error variance in trade openness hence, they were strongly exogenous in the long term. However, RGDP exhibits weak exogeneity in predicting trade openness both in the short term and in the long term.

Finally, exchange rate (EXCR) maintained weak endogeneity both in the short run and in the long run explaining up to 49.84 percent of its forecasted error variance in the short run (period 2) and just 34.89 percent in the long run. It is observed that both external debt stock and trade openness have been maintaining both short run and long run influence on EXCR. In the short run, the two variables jointly explain up to 78.73 percent of the forecasted error variance in EXCR but explain up to 56.68 percent in the long term. Meanwhile, RGDP and FDIN maintain both short term and long term weak exogeneity.

Response to closely One S.D. (df adjusted) innovations 2 S.E.

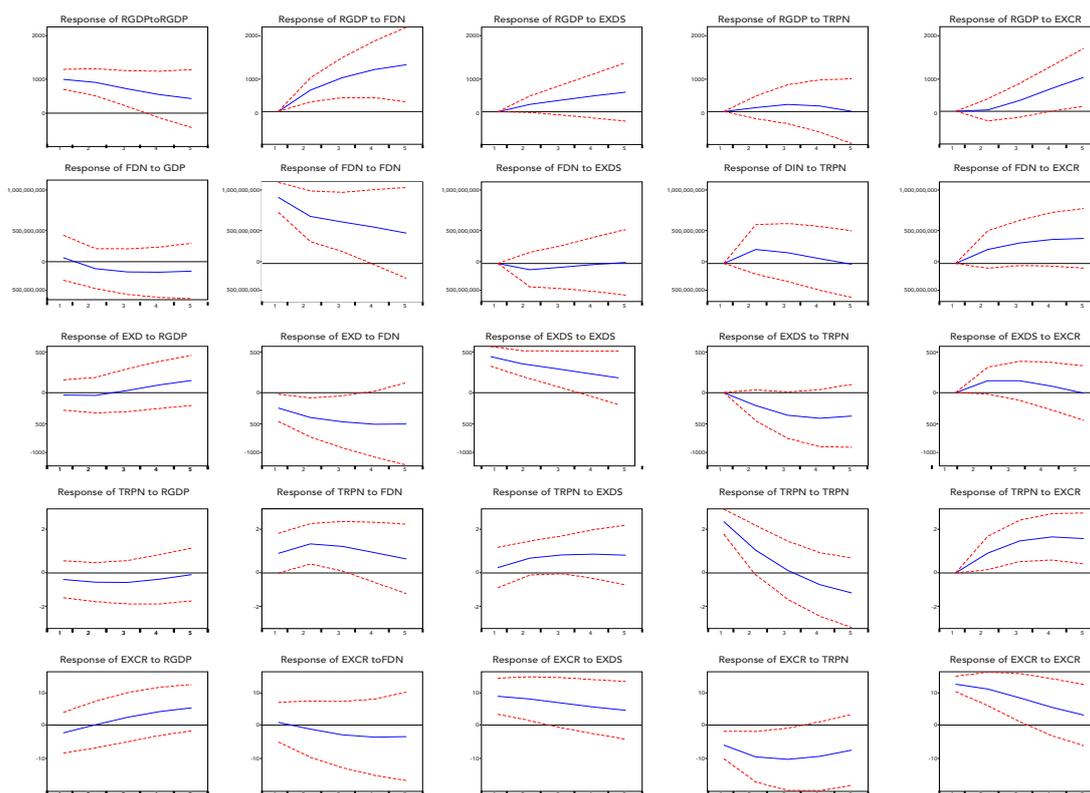


Figure 1: Impulse Response Functions

The impulse response functions indicate that a one standard deviation shock in foreign direct investment will cause RGDP to rise continuously in the short term but such effect diminishes in the long term as RGDP starts to decline steadily. Similarly, a one standard deviation shock in external debt stock will

lead to steady decline in RGDP over time. Meanwhile, a one standard deviation shock in trade openness will lead to a steady decline in RGDP in the short run but such shocks will be speedy in the long term. However, a one standard deviation shock in exchange rate will cause RGDP to decline very sharply in the

short term but starts rising in the long term. The findings of this study is similar to the works of Umme and Manni (2012) and Herath (2010), in that it captures the effect of trade liberalization on economic growth. Further, it is similar to the works of Khan (2007) and Ray (2012) as it examines the influence of foreign direct investment on economic growth. The key point of difference is that this study does not only centres on imports and exports as they affect economic growth. Rather, the study also considers external debt as a key external variable that can affect economic growth.

5.0 CONCLUSION AND POLICY RECOMMENDATIONS

5.1 Conclusion

A modern economy is characterized with interaction with other economies of the world hence, it is likely that external sector shocks will have an impact on the local economy. In this paper, we examined the impact of external sector shocks on the real sector of the Nigerian economy. Key external sector variables of interest were foreign direct investment, external debt stock, trade openness, and exchange rate. The study utilized the correlation analysis, Granger causality, vector autoregressive (VAR) model, variance decomposition, and the impulse response function.

From the correlation analysis, all our selected external sector variables were positively correlated with economic growth, indicating that an increase in any of them will prompt economic growth to be on the rising. Out of

the four external sector variables of interest, it is observed from the Granger causality test that foreign direct investment, trade openness, and exchange rate causes economic growth in Nigeria. Our result from VAR estimate revealed that only foreign direct investment has a significant impact on the growth of the Nigerian economy. Meanwhile, the variance decomposition indicated that there exists some degree of long-term effect of exchange rate on real GDP. Further, the impulse response function indicated that a one standard deviation shock in foreign direct investment will cause a short-term increase in real GDP but the effect will diminish in the long term where RGDP will tend to decline. Moreover, a one standard deviation shock in exchange rate will cause a short-term decline in RGDP but will cause RGDP to rise in the long term.

5.2 Policy Recommendations

The fact that foreign direct investment showcases a significant positive impact on the growth of the Nigerian economy calls for a conducive environment to attract such investment to the domestic economy. For this to have a long-term impact on the Nigerian economy, foreign direct investment should be intense in the tradeable sector, especially in export-based activities such as manufacturing and infrastructural development so as to facilitate positive trade effects. Nigeria's exports should encompass more of manufactured goods rather than primary goods. In this light, industrialization should be encouraged and stimulated.

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Uber Strategies and Competitiveness of Taxi Business in Areas of Operations in Nigeria



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Abstract

This study examined Uber's strategies and competitiveness of taxi business in its areas of operation in Nigeria and how these strategies are disrupting taxi business in Lagos and Abuja metropolises. Two objectives were explored and the hypotheses were structured in line with set objectives. The study adopted the survey research design. Data were collected using primary and secondary sources. The primary data were obtained from 191 respondents using a structured questionnaire designed in five points Likert scale. The respondents comprised a selected number of taxi independent operators and Uber mobile App users in Lagos and Abuja metropolises while the secondary data were obtained from Uber Nigeria Database. The tests of hypotheses were carried out using simple regression analysis with the aid of the Statistical Package for the Social Sciences (SPSS) version 21. The findings of the research showed that Uber's strategies have a significant influence on the disruption of the taxi business in its areas of operations in Nigeria. It also discovered that Uber's technology innovation strategy has a significant influence on the competitive advantage in its areas of operations in Nigeria. Therefore the study concludes that Uber has developed business strategies, and that these strategies to a large extent have enabled Uber Nigeria to gain large market share, competitiveness over its rivalries, customer loyalty, high profit, and projected longer-term

sustainability. The study recommends that the firm should expand to other geographical areas in Lagos in particular, and other states in Nigeria generally, in order to gain more market share and profit. The firm should focus more on research and development to improve on the App-based innovation, and also using the technology innovation strategy, the firm should endeavour to target the segment of the market that has been neglected by the existing taxi operators.

Key Words: Business Strategies, Disruption, Uber Nigeria, Competitiveness, Taxi operators.

1.0 Introduction

The emergence of globalization and unvarying technological changes have brought about a lot of transformations in the world, which propel business organizations to come up with constant strategies and competitive ideas that will not only give them an edge over competitors but also enable them to meet up with international best practices to stand the test of time (Joan & Ramon, 2009). Rapid technological upheavals, privatization expectations, and increased risks of globalization are some of the environmental challenges present-day organizations are encountering (Hosseini; Mehdizadeh & Soltani, 2018). Business organizations are beginning to evaluate their competitive business environment, analyze their strengths and weaknesses while taking cognizance of opportunities and threats in the external environment of operation, and develop competitive and corporate strategies that will sustain the firm in the face of challenging competitive threats (Papulova & Papulova, 2016).

The information age is exemplified by dynamic changes, which is fundamental for the competitiveness of enterprises (Ausra;

K stutis; Neringa & Tadas, 2013). The state of innovative competitiveness in the business environment in recent time has witnessed exceptional increment, which decorously alters the desire of the customers, thereby creating a new set of customers with unique needs, which when sufficiently met by innovative products and services has the predisposition to increase customer satisfaction. (Okechukwu; Ekwochi & Eze, 2018). Offering customers what they see as superior value when compared to the offers of competitors is one of the numerous paths to attaining competitive advantage (Cole, 2008). Superior value can mean a good quality product or outstanding service at a lower price, a premium value offer that signifies a striking blend of price, quality, characteristics, service, a superior product that is worth paying extra for, and other appealing attributes (Chau & Witcher, (2010). Hosseini, Soltani & Mehdizadeh, (2018) also emphasized that being better than rivals entails measuring up and acting in response to universal competition by offering high quality, better value, or low prices to customers. The Taxi industry in Nigeria has experienced massive competition and entry by private individuals and small-scale firms (Gilbert, Hitt, Ireland & Sirmon, 2011). These new entrants make use of e-platforms/e-hailing as a strategy for sustainability. According to Johnson, Dunn & Sack (2020) in their insight2impact's systematic review of platform ecosystems in Africa, Nigeria has become one of the largest e-hailing markets in Africa within a space of few years. E-hailing platforms entered the Nigerian taxi industry for the first time in 2014, with Uber starting its operations in Lagos (Meagher, 2018). Uber extended its operations to the nation's capital territory in 2016 (Johnson, Dunn & Sack

2020). In the same year 2016; Taxify (currently known as Bolt) then joined the taxi market in Lagos 2016. The industry now comprises a few big international players, as well as several smaller homegrown/local firms such as Oga Taxi, which has extended its business operations to Abuja (The Africa Report 2018; Johnson, Dunn & Sack 2020; Meagher, 2018). However, the challenge here is how well and steady these firms can develop sustainable strategies that will enable remain at the top amid fierce competition. It is very pertinent for every business organization in this modern time to embrace constant strategy restructuring (Okechukwu; Ekwochi & Eze, 2018).

Uber Technology Inc., a ride-sharing transportation firm that was introduced in Nigeria in the year 2014 in a bid to achieve competitive advantage and remain on top in a highly competitive and saturated market that is witnessing a lot of low-cost local taxi operators, has adopted a number of strategies (Martin, 2016). These strategies have given the firm a competitive edge over its competitors in the two cities in which it is operating in Nigeria. Uber strategies include disruptive innovation/technology, collaborative consumption (sharing economy), flexible pricing model, celebrity brand ambassador, etc. Among all these strategies, the core strategy Uber is using is disruptive technology/innovation strategy. According to Mutai (2017), Uber Nigeria uses novel digital transformation technology and ensures digital interference in the taxi industry. Technology disruption is the emergence of rapid technological advancement in industries (Chau & Witcher, 2010).

In Nigeria, Uber's customers are generally people who are conversant with hiring rides but the difference is in the value addition strategies – comfort, convenience, safety, speed retort, and consistency. Uber Nigeria has relatively been increasing overall demand and this often occurs when a business organization develops superior, low-cost strategies to solve a widespread customer need in a competitive industry (Clayton; Dillon; Hall & Duncan, 2016). The firm makes use of mobile taxi apps, which have witnessed an incredible explosion in Lagos State, and Federal Capital Territory Abuja (Uber Technology, 2016a). Uber Nigeria entered already saturated taxi industry with some exceptional disruptive but creative strategies using modern technological applications, which has created fear of going out of business among some conventional taxi operators in its areas of operations. This is proven as some of the individual operators are no longer able to face the fierce competition while some are still struggling to break even while maintaining their status-quo without any visible intentions of re-strategizing to meet up with the current business trends. However, there is evidence

of the entrance of similar taxi firms with some strategies related to that of Uber, which should thrust Uber to do whatever it takes to be innovatively competitive as that is the only way their sustainability can be guaranteed (Gilbert, Hitt, Ireland & Sirmon, 2011).

1.1 Objectives of the Study

The broad objective of this research is to investigate various Uber strategies and the competitiveness of the taxi business in areas of operation in Nigeria. The specific objectives, which this research intends to achieve are:

- i. To determine the extent to which Uber strategies disrupt the taxi business / marketplace in Nigeria.
- ii. To ascertain the extent to which technology innovation strategy affects competitive advantage in Uber.

2.0 Review of Related Literature

2.1 Strategies of Uber Nigeria

There are six major strategies Uber is using to gain competitiveness in its areas of operation in Nigeria. They are:

Fig 1: A Conceptual Model illustrating Uber strategies and its competitiveness



Source: Researchers, 2021

1. Technology Innovation (Disruptive innovation)

Disruptive innovation formerly referred to as disruptive technology is a theory propounded by a Harvard Professor; Clayton Christensen, one of the world's renowned experts in innovation and growth in 1997 in his book "The Innovators Dilemma". Clayton noted that speaking about technology disruption

does not imply that the technology itself is disruptive, but its impact on business models or strategy is disruptive (Clayton, 2016).

The disruptive innovation concept, which is influenced by the creative destruction theory of Schumpeter, is used to designate when a novel paradigm of the market offered to customers completely replaces existing ways

of doing things (Chau & Witcher, 2010). Disruptive innovation builds novel markets and finally interrupts existing ones (Vertakova, Rudakova, Shadrina, Kobersy, & Belova 2016). According to, Chau & Witcher, (2010), disruptive innovation can be classified into two; the first one creates a new market that aims at the new customers (new marketplace), and the second tends to compete in a low-value-added segment of an already existing marketplace. In the same vein, Uber Nigeria targeted two markets; the first is the customers who need luxury and are willing to pay and the second are customers who can afford low value but comfortable services (Uber Technology, 2016a).

This corroborates the notion that disruptive innovations perk up value, steals market share, while new products or services substitute existing ones (Clayton; Raynor & McDonald 2015).

- According to Clayton; Dillon; Hall & Duncan, (2016), digital disruptors generate value for customers using at least one of these three media listed below which Uber has applied to gain a competitive edge over its competing conventional taxi businesses.
- Cost value-competing is achieved by rendering customers lower-cost and/or some other cost economic gains.
- Experience value-competing entails offering customers superior experiences. Uber ICT-platform (app) provides information about the driver-partner with whom a customer has been assigned, including the driver names, vehicle model and make, vehicle plate number, driver's expected time of arrival, etc. This information assists the two parties involved to identify each other at their pick-up location (Uber Technology, 2016a). At the end of the trip, the transportation fare is automatically calculated and thereafter charged to the payment system linked to the customer's Uber Nigeria Account. In addition, immediately the trip comes to an end, the Mobile app will request the ride-hailer to rate the driver from grade star points of 1 to 5. Uber Nigeria uses feedback mechanisms, which are designed to support a system of respect and accountability for the concerned entities (Uber Technology, 2016a).
- Platform Value-competing is achieved by creating network effects that benefit customers (Clayton; Dillon; Hall & Duncan, 2016). Uber has an application platform that matches independent drivers with riders through a Smartphone application. An independent driver is someone who has a car, has time, and wants to make some extra money (uberkit.net, 2017). These driver(s) signs up with Uber and they are scrutinized and passed through some psychometric testing and their cars are also investigated by Uber and are put in the Uber system such that when a rider requests a car, the closest independent driver is sent to them. In Uber's areas of operations in Nigeria, customers or clients Use their "Uber App" to request a ride. When a customer requests a ride, a nearby driver-partner accepts the customer's request, the app will display

to the customer the driver's estimated time of arrival, and the app equally notifies the customer when the driver-partner is about to arrive (Uberkit.net, 2017).

2. Convenient Payment

Using this as a strategy, Uber registers details of a customer's debit (ATM) card immediately after the customer signs up for an account. After each ride, the total fare will be automatically deducted from the customer's debit (ATM) card bank account, and automatically paid to the appropriate recipients' accounts respectively (Martin, 2016). This saves both parties the hurdles of looking for spare change and fear of being robbed by a driver or unsuspecting hoodlums. Moreover, the concerned driver will not have to worry about riders short-changing them because the fares will be automatically paid (uberkit.net, 2017).

3. Flexible Pricing Model

Models of pricing can either be cost-based, demand-based, or competition-based (Dana, 2018). Cost-based pricing focuses on the cost of production and the desired profit without putting into consideration the level of demand. In demand-based pricing, investigations are made to ascertain the acceptable price range customers would be comfortable with, from the information gathered, cost requirements and turnover are determined. However, in competition-based pricing, prices are set based on competitors (Dana, 2018). Uber Nigeria's pricing system is flexible, that is, it is using both demand-based and competition-based pricing models. According to Uberkit.net (2017), this implies that the firm can raise its prices or lower the

rates according to the current demand for its services and what is obtainable in the marketplace in terms of its competitors Mutai (2017). Martin (2016) asserted that individuals who are making use of Uber services are already made aware ahead of time of their estimated fare, and the mobile app allows Uber to compare prices across several other competitors' pricing systems.

4. Rating System

Uber Nigeria using this as a business strategy, gives room for a ride-hailer to rate his/her driver at the end of every ride. If a targeted number of ride-hailers rate a driver and rating plunged below the benchmark set by the firm, the driver will be removed automatically from the system. The rating system strategy encourages the drivers to offer and uphold high-value services, ranging from how the drivers keep up their vehicles to how they drive and interact with their clients/customers (uberkit.net, 2017; Mutai, 2017).

5. Celebrity Brand Ambassador

Uber Nigeria added more innovation and creativity to its business by introducing a corporate ambassador (celebrity branding) in 2018. A brand ambassador is a famous individual who uses his eminence to promote a product or service of a particular organization (Lucouw, 2014). The idea of using celebrities in the business environment to attract customers started in 1940 when movie stars posed for tobacco companies. However, using brand ambassadors in the business environment became a popular marketing strategy, over the past few decades (Andersson & Ekman, 2009). Brand ambassadors are usually popular and followed by many fans. This propels business

organizations to use them in marketing their products and services to get their message across.

The aim of using celebrities by most business organizations and brands in marketing and advertisement is to increase sales and ultimately have a positive outcome on the turnover of the concerned firm (McKinney, 2014). In 2018, Uber Nigeria made an official announcement that Bankole Wellington, popularly known as Banky W. is the firm's latest and the first musician/actor 'Brand Ambassador' in Nigeria.

Uber realized that Entertainment is currently trending and the majority of the key players in the entertainment industry have millions of fans who are loyal to them. Uber Nigeria sees this as another opportunity to leverage to acquire more market share. According to Uber West Africa Marketing Leader, Margaret Banasko (2018), after a lot of considerations and careful thoughts by the management, the firm decided to go into partnership with Banky W because he is a popular, highly influential, well-respected, and multi-facet artist who channels his dealings across industries such as music, movie, production, and business. Also, to a high extent, connects on social media and has a great link with his fans, which are the characteristics that are requirements for achieving targeted goals (Uberkit.net, 2017).

According to Lucouw, (2014), incorporating a celebrity brand ambassador by a firm enhances the chances of its products and services being sold more than that of competitors. A brand ambassador has a very high propensity to get across a target market,

create and/or strengthen brand image, increase brand awareness, and achieve brand differentiation (Wilson; Stavros & Westberg, 2010). As a brand ambassador; Banky W's task is to keenly introduce Uber services to potential riders, introduce new products and services, assist current users to appreciate the App usage by creating an astral customer experience for ride-hailers in all connections, implement marketing strategies and initiatives and positively represent the firm at large (Uber.com, 2018).

6. Collaborative Consumption (Sharing Economy)

According to Rowe, (2017), collaborative consumption is a recent business idea, although it began to make waves in the early 2000s. Collaborative consumption also refers to as sharing economy was first introduced in 1978 by Felson and Spaeth. They defined the term as transactions in which individuals were consuming products while employing in common activities (Felson & Spaeth, 1978 in Rowe, 2017). However, Botsman, (2013) stated that collaborative consumption is still in its prime and that it does not entail changing what we consume but how we consume. It entails using the power of technologies to create trust between strangers and allows a significant connection. Perren & Grauerholz, (2015) stated that in as much as collaborative consumption has gained the most fame in some developed countries such as Australia, The United Kingdom, the United States of America, etc; developing nations are also beginning to implement this new business strategy.

According to Hamari, Sjoekint, & Ukkonen (2016), sharing economy is a business idea

that inculcates many ICT developments and technologies. It also supports sharing the use of products and services through online platforms. Rachel Boston; a global thought leader on the sharing economy and originator of 'Collaborative Lab' defined sharing economy to be the swift fit in sharing, exchanging, trading, renting, and bartering being re-invented through the most modern technologies and peer-to-peer activities in marketplaces to a degree that has never been achieved before. Uber Nigeria is using collaborative consumption (sharing economy) as its strategy to gain competitiveness over competitors in Lagos and Abuja metropolises because it uses Smartphone Apps and ICT platforms that involve modern forms of payment, booking, and rating systems (Botsman & Rogers, 2010; [Hamari, Sjöklint, & Ukkonen, 2016](#); Rowe, 2017),.

The intellect of the sharing economy according to Wallsten, (2015) was to fit together with new technologies such as GPS, smartphones, payment systems, feedback mechanisms, and identification, to allow almost anyone with the precise assets to make those services accessible. Uber imbibed first, the strategy of turning people's unused or underused assets into resources that are productive and cost-effective and delivering transportation services through the use of the internet and other Information Communication Technology Application platforms (Uber Technology, 2016b). Uber Nigeria addressed this issue by creating an avenue whereby car owners can generate income out of their idle or underused resources. This is also useful to people who choose to work part-time using their vehicles registered under Uber (Uber.com, 2018).

It is widely believed that collaborative consumption markets are more flexible, dynamic, and less institutionalized than conventional markets. It has come into view as a feasible substitute to conventional business in industries such as banking transportation, retail, and hospitality (Rowe, 2017; Hamari, Sjöklint, & Ukkonen, 2016). According to Adriana (2017), developing nations have a great potential to benefit from collaborative practices to improve lack of access to resources As can be deduced that majority of firms applying the collaborative consumption strategy aim towards adding more value to the life of consumers while maintaining competitive advantage, profitability, and market leadership.

2.2 Services/Packages of Uber in Nigeria

Uber Nigerian offers a variety of service packages in Nigeria; Uber Black, Uber XL, UberPool, Uber SUV, LUX, Flash, Select, etc using similar ICT-platforms but giving diverse levels of pricing, size of vehicles, quality, and intended customer groups. Uber's ICT-platforms enable new forms of booking, rating, and payment functionalities, (Meelen & Frenken, 2015). UberBLACK is an Uber service where passengers are driven by professional drivers in luxury cars. The cost is often about twice the charge that an UberX driver would receive (Uberkit.net, 2017). This UberBlack is Uber's premium service/package. (Uber Technologies, 2016b). Uber X is Uber's economy service that costs less than a conventional taxi though it uses very comfortable vehicles. UberPool matches a ride-hailer with some other riders going in the same direction so that they can share the ride and its cost (Uber.com, 2019).

2.3 Sustainability of Uber Nigeria Strategies

Teece, 2010, posits that, the pursuit for sustainability in the present business environment as a shared obligation is challenging business organizations and imposing change programs in business model design, that is, the processes, practices, technologies, and stakeholders that convey the value of products and services to consumers. Alvarez; Barney & Newman (2015) asserted that sustainability is not a one-time model, rather, it is about learning, creating collaborating, implementing, assessing, and constantly evolving. However, Ansari; Weber; Hood; Otto; & Sawayda (2015) opined that the long-term sustainability of Uber Nigeria is dependent on the organization to manage future risks in five key areas as stated below:

Drivers: If for any reason Uber Nigeria raises its profit-share deductions, this could lead to an increased number of dissatisfied drivers beyond the control of the firm, which may lead to Uber's loss of already acquired market shares. Besides, to avoid negligence and increased liability insurance costs, training programs should be organized for the drivers to get them abreast of international best practices in the modern business environment.

Competitors: Uber Nigeria's business model is likely to be created by similar ride-hailing transportation organizations. More ride-hailing taxi operators are emerging as more with better business models could still emerge in the nearest future.

Customer Base: Presently, Uber Nigeria

offers technology-oriented services/packages that are highly competitive in the taxi industry where there is extreme competition for rates. Therefore, improving the rides-for-services' demand has become a constant future challenge that demands attention primarily to improve safety, value, and rates, which boast cost/benefit to both ride-hailers and drivers.

Technology: Due to unforeseen circumstances such as hacking of a firm's database, it is expedient that Uber Nigeria constantly upgrades its database security structure to minimize financial and/or personal account information risks. Also, Uber Nigeria should bear in mind that there can be an upgrade in technology which may warrant customers, in the long-run, to become wary of downloading and updating the same apps.

Customer satisfaction: Waiting so long after booking a ride and encountering some bad-mannered and inexperienced drivers are some of the unpleasant experiences customers may have. Therefore, Uber Nigeria ought to regularly make use of its rating system to evaluate customer complaints and address them promptly to perk up customer satisfaction, loyalty, and sustainability.

Lack of constant, effective restructuring, research, and development, and implementation of suitable strategies to improve their ability to create and capture exceptional value will lead to loss of competitive advantage and sustainability in the short-run. Therefore, there is a greater need for Uber Nigeria to come up with more suitable and applicable strategies that will enable it to penetrate more markets, satisfy

customers, maintain a competitive edge, sustainability and increase profitability.

The most effective tool for increasing shareholders' return and attaining long-term sustainability should be an imaginative and distinctive strategy that distinguishes a firm from its competitors and attains a competitive advantage. The upsurge of modern technology and globalization should propel business organizations to imbibe the culture of restructuring their strategies to meet up with international best practices, maintain a competitive edge and sustainability over competitors. Premium strategies should be such that reveal the activities that concerned shareholders are using in the marketplace to improve the financial performance of the firm, gain a competitive edge over rivals, strengthen its long-term competitive position, and maintain a longer-term market leadership (Malowa, 2017).

2.4 Competitive Nature of Taxi

Business in Uber's Areas of Operation in Nigeria

Constant technological changes have come to define the way of doing things effectively and efficiently in a business environment (Kristyn, 2016). In the transportation sector, the setting is fast-changing not only in Nigeria but equally, across the globe as technology becomes more advanced and sophisticated (Malowa, 2017). The Taxi industry in Nigeria has experienced massive competition by both private individuals and small-scale firms. However, due to the constant change in technology, globalization, lack of viable business ideas on the part of some firms to restructure their strategies and align themselves to modern business practices,

some have gone moribund; some have been acquired; some are at the verge of winding-up while some are struggling to remain in business and /or break-even (Okechukwu; Ekwochi & Eze, 2018).

Many businesses can no longer survive because they cannot keep up with evolving market demands as a result of continuous technological changes and disruptions (Kristyn, 2016). This can be justified in the close-up and exit in the business of some well-known transportation companies in Nigeria. Reasons that led to the shutdown of some of these transport companies can be attributed to the failure to put appropriate structures and strategies in place. These firms had strategies they were operating in but at the emergent of a new era in business, some of these firms maintained their 'archaic' way of doing business, however, globalization has created a new set of customers with unique needs (Okechukwu; Ekwochi & Eze, 2018).

2.5 Theoretical Literature

2.5.1 Technology-Organisation-Environment Framework Theory

DePietro, Wiarda & Fleischer propounded the Technology-Organization-Environment Framework theory in 1990. The theory stated that the method by which an organization approves and executes technological innovations is influenced by three principal contexts, which are - technological context, the organizational context, and the environmental context (Lippert, & Govindarajulu, 2006; DePietro, Wiarda, & Fleischer, 1990; Malowa, 2017; Bradford; Earp & Grabski, 2014). The theory can be used to make a dissimilarity of the fundamental qualities of the technology itself

and the influencing factors on the organization and its work environment (West & Wood, 2014; Malowa, 2017).

The technological context is made up of available technologies/innovations to the firm and similar innovations/technologies available in the marketplace that will enable the firm to improve its organizational productivity (Malowa, 2017). The organizational context is classified in terms of resources accessible to maintain the approval of the innovation, which include firm scope and capability, formalization, centralization, interconnectedness, and intricacy of the administrative formation; and the availability and quality of the firm's personnel. The environmental context is concerned with how the firm conducts its business in the presence of fierce competition and the capability of the firm to acquire resources supplied by others, and its dealings with the government (Malowa, 2017; Govindarajulu & Lippert, 2006).

Several kinds of research (Govindarajulu & Lippert, 2006; Chau & Tam, 1997; Malowa, 2017; Gibbs and Kraemer, 2004; Lacovou; Benbasat & Dexter, 1995; Thong, 1999; Kuan & Chau, 2001; Zhu; & Dedrick, 2004; Zhu; Kraemer & Xu, 2003; Kraemer & Zhu, 2005; Norman, 2014) have used the technology-organization-environment framework theory as their theoretical framework to examine the level of technology adoption in business organizations in different sectors. This research also used this theory to determine how the adoption of App-based (Technology innovation) as a strategy by Uber will help the firm attain a high level of competitiveness in its areas of operation and equally help them to gain more grounds in the marketplace and

maintain a competitive advantage.

2.5.2 The Resource-Based View Theory

Wernerfelt propounded the resource-based view theory in the 1980s. The theory was used in the early 20th century as a cost-effective tool for a firm, which is aimed at helping a firm to achieve competitiveness. The foundation of the theory is that thriving business organizations will discover their potential competitive advantage on the growth of distinguishing and unique competencies, which may often be implicit or intangible (Wernerfeit, 1984; Onyeaghala & Odiba, 2018). This theory is a foundation for the competitive advantage of an organization that lies mainly in the appliance of a collection of costly; substantial or insubstantial resources at the organization's reach, which must be diverse and inert (Laosirihingthong, Prajogo & Adebajo 2014; Mutai, 2017; Prahalad, 1996).

Diversity is in deference to the kind of resources an organization controls. Moreover, the resources are expected to exist over time because they will be used to execute other organization's strategies (Mutai, 2017). The organization's unique resources and competencies offer the fundamental nature of strategy (Onyeaghala & Odiba, 2018). The RBV theory recommends that competitiveness and performance outcomes are results of an organization's explicit resources and potentials that are costly to imitate by competitors. Therefore, when a firm is working toward gaining competitiveness, it is imperative to craft the resources possessed by the firm and see how such resources can be used for the actualization of the firm's sustained

competitiveness.

The RBV theory argues that a firm's capabilities and resources create the competitive advantage instead of the market product activities thereby conveying different organizational performances that are not explained by the factors of the industry. Fundamentally, the capabilities of an organization and its resources are the main focus of the resource-based view theory (Onuoha & Olori, 2017). Therefore, this theory is of the essence to this research because it helps to explain how Uber uses the available resources to attain a competitive advantage, maintain sustainability and quality control levels.

2.6 Empirical Review

Onyeaghala & Odiba (2018) did a comparative study on business strategy as a driver of competitiveness in organizations: a study of selected mobile telecommunication companies in Lagos, Nigeria. The study adopted a survey research design while the primary source of data was collected using a questionnaire designed in five points Likert-scale, ranging from strongly agree to strongly disagree. The population of the study consists of 139 top-level managers of MTN and Glo, Mobile Telecommunication Company Nigeria while the sample size obtained from the population was 103 using the Taro Yamane sample size determination formula. Data of the study were analysed using frequency tables and a simple percentage method. Formulated hypotheses were tested using the Karl Pearson Product Moment Correlation techniques. The result of the research reveals that cost leadership has an influence on organizational competitiveness,

which means that as a particular firm takes the lead in cost in an industry, such a firm will attain a higher level of competitive leverage over its competitors. It also reveals that the competitive leverage of an organization over other competitors to a great extent depends on its product differentiation among other generic business strategies. It further discovered that a generic strategy of focus can go a long way to helping organizations to achieve competitive leverage over other organisations in the same industry. The study also showed that there is a link between business strategy and organizational competitiveness which is a contemporary issue in the field of strategic management.

Oyedijo (2012) investigated strategic agility and focus on performance in the Nigerian telecommunication industry using data generated from nine (9) firms in Nigeria's telecommunication industry. The data were generated from the questionnaire that was completed by members of the Top Management Team of each company. A five-point Likert-type scale based on 21-items derived from existing literature was used to measure and assess the location of the sampled telecommunication firms on different dimensions of strategic agility. The result showed that strategic agility impacts the focused performance of media transmission firms in Nigeria and that there is a big connection between strategic agility and competitive performance. Onuoha & Olori, (2017) reviewed business strategies and sustainable competitive advantage of banks in Port Harcourt. The population of the study comprised all 15 Deposit Money banks registered under the universal banking system while data compiled from 131

respondents from 15 banks in Rivers State. The aim is to ascertain the relationship and possible effect of dimensions such as product differentiation, cost leadership, and focus/niche strategy on measures such as brand reputation and customer loyalty. The study used the cross-sectional overview and analysis was done using Spearman rank correlation order employing statistical package for social sciences (SPSS) version 21. The result of the study showed that a significant relationship exists between business strategies and sustainable competitive advantage. Based on the findings, the study recommended that organizations should take into cognizance the cost of production and should try to produce their products at the lowest cost possible, without compromising quality desired by their consumers; also, organizations should engage in high technological changes and improvement to gain a competitive advantage and remain competitive over others.

Malowa (2017) competitive strategies adopted by ride-hailing companies in Nairobi, Kenya to sustain competitive advantage in the taxi industry. The research employed the survey design. The target population comprised three ride-hailing service providers in Nairobi (UBER, Little Cab, and Taxify). Sixty (60) respondents across the three ride-hailing service providers participated in the study. The respondents were contractors/driving partners affiliated with the three ride-hailing companies (UBER, Taxify, and Little Cab). The result of the research showed that the companies mainly applied three competitive advantages: product differentiation, cost leadership, and focus strategies each with a varying degree of

influence on the competitive advantage achieved. The research concluded that focus strategies such as availability of service across various platforms, certainty and accuracy in pricing and billing, communication and feedback between the companies and contractors/clients had a stronger impact in increasing the competitive advantage gained.

Research Design

The research design adopted in this work is the survey technique with the use of a questionnaire. The reason for the survey method is due to the nature of the research which involves people's reactions to Uber strategies, its competitiveness, and how it is disrupting taxi operators in its areas of operation in Nigeria. The data used for this work were sourced through primary and secondary means. The primary data were obtained from a well-structured questionnaire that was designed using a five-Likert scale format while the secondary instrument for data collection is from Uber Nigeria Database, journals, articles, and encyclopedias.

Instrument of Data Collection

The main instrument used in collecting data for this research is a structured questionnaire. The questionnaire served as the source of primary data used. The questionnaire consists of two sections. The first section is the demography of the respondents while the second section consists of the structured questions related to the study. A five-point Likert scale was adopted where a set of the statement was given to the respondents for them to choose from the options. Data were presented in tables and the descriptive

statistic was used to analyse the data. The questionnaire was ranked as follows:

Key:

- Strongly Agree = SA = 5
- Agree = A = 4
- Undecided = U = 3
- Disagree = D = 2
- Strongly disagree = SD = 1

Sample Size Determination

The sample size determination was done using Trek (2004) sample size determination formula.

The formula is given by
$$\frac{Z^2Pq + e^2}{e^2 + \left(\frac{Z^2Pq}{N}\right)}$$

(Bartlett, Kotrlik and Higgings, 2001)

- Where, n = sample size
- z = standard error of the mean (usually 95%, corresponding to 1.96 in the z-distribution table).
- p = proportion of the population likely to be included in the sample (50% or 0.5 is assumed).
- e = level of significance (assumed to be 5% or 0.05)
- N = population size (N = 374).

Substituting in the formula, we obtain:

$$n = \frac{(1.96^2 \times 0.5 \times 0.5) + 0.05^2}{0.05^2 + \left(\frac{1.96^2 \times 0.5 \times 0.5}{374}\right)}$$

$$n = \frac{(3.8416 \times 0.5 \times 0.5) + 0.0025}{0.0025 + \left(\frac{3.8416 \times 0.5 \times 0.5}{374}\right)}$$

$$n = \frac{0.9604 + 0.0025}{0.0025 +$$

$$(0.9604/374)$$

$$n = 0.9629/0.0025 + 0.002568$$

$$n = 0.9629/0.005034$$

$$= 190.9961$$

Therefore, the optimum sample size is 191.

Breakdown of Sample Size Allocation

Bowley's proportional allocation model would be adopted. The model is stated below:

$$nh = \frac{nN_h}{N}$$

Where

- nh = number of units allocated to each category
- Nh = number of items in each category
- n = sample size
- N = population size

1. Employees of Uber Nigeria

$$= \frac{191 \times 85}{379} = 43$$

2. Taxi/cab operators in Lagos

$$= \frac{191 \times 289}{379} = 145$$

3. Licensed Taxi/cab operators in Abuja

$$= \frac{190 \times 5}{379} = 3$$

Total = 191

DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

Suitable descriptive statistical techniques such as tables, percentages, and simple linear regression were used in presenting, and analyzing the data generated.

TEST OF HYPOTHESIS

Table 1: Summary of descriptive statistics for all the continuous variables of the study

Variables	N	X	S.D
Uber strategies(X)	191	11.75	2.496
Disruption of taxi business (Y):	191	12.02	2.033
Technology innovation (X):	191	12.28	2.167
Competitive advantage (Y):	191	12.33	1.966

Source: Field Survey, 2021

Results of analysis in table 1 show the descriptive statistics for all the continuous variables of the study.

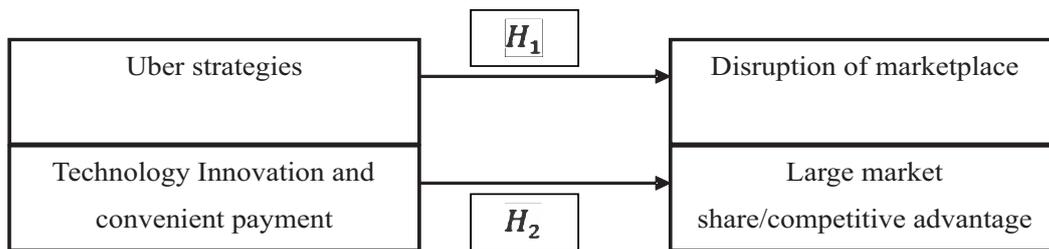
The Regression Models

The simple regression model that was employed in the study is mathematically stated as:
shown in equation 1b

$$Y = a + \beta_{1x1} + \beta_{2x2} + \mu \text{-----} 1b$$

where Y = disruption of market place, large market place/competitive advantage, sustainability/quality control level and customer loyalty/high profit.
 a = intercept
 $\beta(1-2)$ = Slope coefficients of the structural variables X1 to X2
 X1 =Uber strategies
 X2 =technology innovation and convenient payment
 μ =Error term

The research model is summarized in figure 2
Figure 2: Research Model



Source: Adapted from Bhowmick, & D'Souza, (2014)

Simple Linear Regression Result

H01: There is no significant influence of Uber strategies on the disruption of the taxi business in its areas of operation in Nigeria.

The independent variable in H01 above is Uber strategies while the dependent variable is the disruption of the taxi business in its areas of operations in Nigeria. The outcome of the analysis are presented and discussed below.

Table 2: Regression Analysis Extent to which Uber Strategies Disrupt the Taxi Business/Marketplace in Nigeria

Table 2a: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.568 ^a	.323	.319	1.677	1.690

a. Predictors: (Constant), strategies b. Dependent Variable: disruption

Source: Research Survey, 2021

Table 2b: Statistical Significance

ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	253.421	1	253.421	90.110	.000 ^a
Residual	531.532	189	2.812		
Total	784.953	190			

a. Predictors: (Constant), Uber strategies b. Dependent Variable: disruption of taxi business

Source: Research Survey, 2021

Table 2c: Estimated Model Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	6.580	.585		11.242	.000
Strategies	.463	.049	.568	9.493	.000

a. Dependent Variable: disruption

Source: Research Survey, 2021

H₀2: There is no significant relationship between Uber's technology innovation strategy and competitive advantage. The independent variable in this hypothesis was

Uber's technology innovation strategy while the dependent variable was a competitive advantage. The outcome of the analysis are shown in the tables below:

Table 3a: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.476 ^a	.227	.223	1.733	1.782

a. Predictors: (Constant), Uber technology innovation strategy

b. Dependent Variable: competitive advantage

Source: Research Survey, 2021

Table 3b: Statistical Significance

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	166.565	1	166.565	55.457	.000 ^b
	Residual	567.655	189	3.003		
	Total	734.220	190			

a. Predictors: (Constant), Uber technology innovation strategy

b. Dependent Variable: competitive advantage

Source: Research Survey, 2021

Table 3c: Estimated Model Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	7.025	.723		9.713	.000
Innovation	.432	.058	.476	7.447	.000

a. Dependent Variable: Competitive Advantage

Source: Research Survey, 2021

DISCUSSION OF FINDINGS

The first hypothesis seeks to determine Uber strategies and to what extent those strategies disrupt the taxi business in its areas of operation in Nigeria. The results of the hypothesis point out that the calculated f-value; 90.110 is higher than the critical f-value of 3.89 at a 0.05 level of significance with 1 and 189 degrees of freedom.

The findings reveal that Uber's strategies have a significant influence on the disruption of the taxi business in its areas of operations in Nigeria.

The R square in table 2b measures the level of determination coefficient of the predictor (Uber strategies) on the disruption of the taxi business in its areas of operations in Nigeria. It predicts that 32.3% of the variation in disruption of the taxi business in its areas of operations in Nigeria is elucidated by the variation of the predictor (Uber strategies), While 67.7% of the variations in the disruption of the taxi business in its areas of operations in Nigeria is described by other variables which are unrelated to this research.

The coefficients in table 2c of 0.463 (46.3%) show that a percentage rise in Uber strategies while every other variable is held constant would amount to a 46.3% increase in the disruption of the taxi business in its areas of

operations in Nigeria. The t-statistics in the third table reveal that the computed t-value for Uber strategies (9.493) is higher than the critical t-value of 1.972 at a 0.05 level of significance with 189 degrees of freedom. The implication of this is that the predictor (Uber strategies) has a significant impact on the disruption of the taxi business in its areas of operations in Nigeria. This means that the superior the level of Uber strategies, the higher the level of disruption of the taxi business in its areas of operations in Nigeria and vice-versa.

These findings are in agreement with Mutai (2017) that Uber Nigeria uses the new digital transformation is disrupting business activities in the taxi industry in its areas of operations. This assertion can be supported with the definition of technology disruption given by Chau & Witcher, (2010) as the emergence of rapid technological advancement in industries.

The finding is also in consonance with Clayton; Dillon; Hall & Duncan, (2016) assertion that digital disruptors create value for customers in at least one of these three ways: - experience value, cost value, and/or platform value, which Uber has applied to gain a competitive edge over its competing conventional taxi businesses.

H₀₂: To ascertain the extent to which technology innovation strategy affects competitive advantage in Uber.

The second hypothesis investigated the extent to which technology innovation strategy affects competitive advantage in Uber. The results of the hypothesis indicate that the calculated f-value of 55.457 is greater than the critical f-value of 3.89 at a 0.05 level of significance with 1 and 189 degrees of freedom.

This result implies that Uber's technology innovation strategy has a significant influence on the competitive advantage in its areas of operations in Nigeria.

The R square in table 3b measures the degree of determination coefficient of the predictor (Uber technology innovation strategy) on competitive advantage in its areas of operations in Nigeria. It predicts that 22.7% of the variation in competitive advantage in its areas of operations in Nigeria is accounted for by the variation of the predictor (Uber technology innovation strategy), While 77.3% of the variations in the competitive advantage in its areas of operations in Nigeria is explained by other variables which are not connected to this research.

The coefficient in table 3c of 0.432 (43.2%) shows that a percentage increase in Uber's technology innovation strategy while every other variable is held constant would lead to a 45.4% increase in competitive advantage in its areas of operations in Nigeria. The t-statistics in table 6 above show that the calculated t-value for Uber strategies (7.447) is greater than the critical t-value of 1.972 at a

0.05 level of significance with 189 degrees of freedom. This entails that the predictor (Uber technology innovation strategy) has a major impact on the competitiveness of the firm in its areas of operations in Nigeria. That is, the higher the level of Uber's technology innovation strategy, the higher the level of the competitive advantage in its areas of operations in Nigeria and vice-versa.

These findings are consistent with Chau & Witcher, (2010) who concluded that disruptive innovation can be classified into two; the first one creates a new market that aims at the new customers (new marketplace), and the second tends to compete in a low-value-added segment of an already existing market.

In the same vein, Uber Nigeria targeted two markets; first is the customers who need luxury and are willing to pay and the second are customers who can afford low value but comfortable services, all to attain a competitive advantage over its competitors (Uber Technology, 2016a). This corroborates the notion that disruptive innovation perks up value, steals market share, while new products and services substitute existing ones (Clayton; Raynor & McDonald 2015).

SUMMARY OF FINDINGS

Findings from the study reveal the following:

- i. Uber strategies have a major influence on the disruption of taxi industry in its areas of operations in Nigeria ($R^2 = 0.323$, $f_{calvalue} 90.110 > f_{cvalue}$ of 3.89, $t_{calvalue} = 9.493 > t_{cvalue}$ of 1.972, $P = 0.00 < 0.05$).
- ii. Uber technology innovation strategy has a significant influence on the

competitive advantage in its areas of operations in Nigeria ($R^2 = 0.227$, $f_{calvalue} 55.457 > f_{cvalue}$ of 3.89, $t_{calvalue} = 7.447 > t_{cvalue}$ of 1.972, $P = 0.00 < 0.05$).

CONCLUSION

The study investigated Uber strategies and the competitiveness of the taxi business in its areas of operation in Nigeria. From the result of the findings and the hypotheses tested, the research, therefore, reach the following conclusions:

Uber Nigeria has some unique strategies it has employed in its areas of operations and these strategies to a reasonable extent are disrupting the taxi business in these areas. Technology innovation strategy has a high positive effect on competitive advantage in Uber Nigeria.

RECOMMENDATIONS

i. The study revealed that Uber

strategies have a major influence on the disruption of the taxi business in its areas of operations in Nigeria. Since this disruption is in favor of Uber Nigeria, the firm is advised to expand to other geographical areas in Lagos in particular and other States in Nigeria generally to gain more market share and profit.

ii. The study discovered that Uber's technology innovation strategy has a significant influence on the competitive advantage in its areas of operations in Nigeria.

However, it is suggested that the firm should focus more on research and development to improve on the App-based innovation and also using the technology innovation strategy, the firm should endeavor to target the segment of the market that has been neglected by the existing taxi operators.

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