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DEFICIT FINANCING ASYMMETRY AND NIGERIA'S ECONOMIC GROWTH: A NONLINEAR AUTOREGRESSIVE DISTRIBUTED LAG APPROACH

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ABSTRACT

This study examine deficit financing asymmetry and Nigeria's economic growth using time series quarterly data covering the period of 2000 to 2019. The study is hinged on Keynesian, Monetary Neo-Liberal theoretical postulations to ascertain the asymmetry and significance relationship between deficits financing and Nigerian economy. The study applied Non-Linear Autoregressive Distributed Lag (NARDL) technique. The estimated NARDL model reveals that both positive and negative deficits financing innovation reduces economy growth; however, the impact of negative deficit financing innovation is greater than the positive innovation. In addition, the Nigerian economy is also driven by weak institutions and low level of savings culture, which is evidence in negative signs of both coefficients of savings and quality institution. This study therefore lend support for fiscal governance through review of laws that made the existing institutions and further strengthen in line with global best practice to guide and monitor the implementation of deficit financing in investment-oriented projects that can translates to better standard of living of the citizenry.

Contribution/Originality: This study examined deficit financing asymmetry and Nigeria's economic growth using time series quarterly data covering the period of 2000 to 2019. This study uses NARDL model against other techniques in the reviewed empirical works and the findings reveals that both positive and negative deficits financing innovation reduces economy growth. In addition, the Nigerian economy is also driven by weak institutions and low level of savings culture, which is evidence in negative signs of both coefficients of savings and quality institution.

1. INTRODUCTION

At the global level, there pro and con voices raised against stimulating the public investments in order to overcome the effects of the economic downturn and this diverse opinion is not new, and has as pawns John Maynard Keynes, the artisan of public investments during the crisis for stimulating the consumption (Kaplanoglou & Rapanos, 2013). Keynes who is a demand-side analysis stressed the need for increase in government outlay even beyond current revenue (that is deficit financing), especially during depression as witnessed during the Great Depression of 1929 to 1932, and more recently, the 2008 Global Financial and Economic Crisis. Deficit financing to the Keynesians is an important tool to achieve a desired level of aggregate demand consistent with full employment and further implies an economic situation where present revenue is insufficient to match government present outlay. To Ubi and Inyang (2018) fiscal deficit simply refers to actions taken by government with a view to

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controlling government expenditure and income in order to achieve some predetermined macro-economic objectives while CBN (2016) sees it as shortage of income that results when spending exceeds income over a particular period of time. Study such as Dritsaki (2013) did demonstrate the possibility of borrowed funds to have positive or negative effect though this depend the area of allocation. There is also burden impose on the fiscal situation of the country in borrowed funds, in terms of maintaining the borrowed funds by way of charges/interest rate on the principal amount. However, it could have a negative impact when it is employed for private and public consumption. To this end, increase in public expenditure through borrowing should not be central government priority rather the effects that are intended to be achieved must be taken into consideration, and this aspect is often overlooked (Mihaiu, 2011; Mihaiu. & Opreana, 2013).

Theoretically, it is expected that if the marginal product of capital should be higher than the world interest rate for developing countries, then these countries would benefit from external borrowing, this views is supported by Keynesian economists (Dritsaki, 2013). To Keynes, advocates for deficit financing to effect a transition from mass unemployment to near full employment. Contrarily, Monetary theory pioneered by Friedman (1963) opined that increasing deficit financing leads to increases in money supply in turn to increases in inflation (Sargent & Wallace, 1981) and this has serious implication on the economic growth. Some empirical results such as Biza, Kapingura, and Tsegaye (2015); Arjomand, Emami, and Salimi (2016) support the positive impact of deficit financing to growth while others such as Ahmad (2013); Velnampy and Achchuthan (2013) align with negative effect of fiscal deficit on economic growth. The need for deficit financing put forward in dual gap theory arises from the deficiency/low savings and foreign exchange earnings (Chenery & Strout, 1966) with adverse effect on investment. Thus, the developing countries like Nigeria often constraint with limited resources to invest in all sectors. This is evidence as Nigeria savings mobilization and tax revenue to GDP ratio stood at 15.69% and 5% of GDP which is far from the international benchmark of 30% and 15% of GDP in 2018. Therefore, deficit financing remains one option to fill the saving-investment gap to break the 'vicious circle of poverty'.

Another basic impediments to economic progress in developing country like Nigeria is in the uncertainty and manipulation in the judicial system, corruption, bribery, ill-defined property rights and the existence of inefficient institutions cause those countries to be risky and unattractive (Birdsall, 2007; Fosu, Bates, & Hoeffler, 2006; Luiz, 2009; Sule, 2020). Kaplanoglou and Rapanos (2013) further allude that weak domestic institutional budget framework emerges as the main reason for weak fiscal performance. This is essential as IEG World Bank (2014) revealed that good public procurement practices are a major determinant of the effectiveness of public expenditure. In other to make economic progress, Nigeria established Independent Corrupt Practices Commission (ICPC) in 2000, Economic and Financial Crimes Commission (EFCC) in 2004, Fiscal Responsibility Commission (FRC) in 2007, National Public Procurement Act, 2007. Unfortunately, report reveals that revealed that there are about 4000 uncompleted or abandoned public projects all over Nigeria (Ewa, 2013) and the reason is not farfetched especially regarding weak institutions to drive fiscal policy(s) implementation.

Global benchmark say that public debt is sustainable if the budget deficit does not exceed 3% of GDP and indebtedness not exceeding 60% of GDP (World Bank, 2019). Nigerian economy rising fiscal deficit is worrisome from ₦285.10billion in 1999 to ₦1.56trillion in 2015 and whopping figure of ₦2.79trilion in 2019. World Bank's allude that, increase in fiscal deficit is a peculiar phenomenon in emerging and developing economies, especially given the growing demand for infrastructural facilities and other essential goods and services. On the other hand, Nigerian economy has witnessed an upward trajectory in economic growth on average of 6.7% for the period of 2000 to 2015 and further witnessed contraction in 2016 by -1.6% on the account of fall in crude oil price. In 2017, it witnessed appreciation by 0.7% and this has remained on a positive trajectory at 1.91% and 2.27% in 2018 and 2019 respectively (National Bureau of Statistics, 2019). Based on European convergence criteria, Nigeria the ratio of government deficit relative to gross domestic product (GDP) at market prices, stood at 5.57% in 1999 but since then (2000 to 2016; 2018 & 2019), it hovers around less than 3% except 2017 where it stood at 3.17% (National

Bureau of Statistics, 2019). In terms of total indebtedness to GDP, it stood at a higher threshold of 63.54% in 1999 and ever since then, it has being moving on a downward trend reaching the lowest figure in 2008 at 7.26% before it started rising again with the figure at 16.07% in 2019.

The above trends on deficit financing relative to GDP in Nigeria is an indication that the current borrowing status might not really be deleterious to the economy but the worrisome aspect is its impact on the economic fundamentals that translates to better standard of living. Within the period of the study (1999 to 2019), socio-economic indicators such, national poverty incidence average 58.36%, national unemployment rate average 18.15% while income inequality represented by gini-coefficient average 45.57% respectively. These indicators are not a good sign of an economy aspiring to be among the 20 largest economies in the nearest future especially given the continuous rise in budgetary expenditure, in addition to deficit financing rising year-in-year-out. Against this backdrop, this paper examine deficit financing on Nigerian economy. We empirically test the hypothesis that deficit financing have had an asymmetric and significant influence on Nigeria's economic growth. In other to achieve the stated objective, this study applied a single case study on Nigeria and the choice of Nigeria is based mainly on its growing public deficits, weak institutions, infrastructural deficit and as well as data availability. Since the stationarity of variables are a combination of I(0) & I(1), the study adapted the Non-linear ARDL (NARDL) approach of Shin, Yu, and Greenwood-Nimmo (2014) to test whether economic growth respond to government's deficit financing covering the period of 2000 to 2019 using quarterly data.

The remainder of this study is organized as follows. In section 2, the study presents the empirical literature. Section 3, presents the methodology employed, the results obtained from the estimation of the model and discussed. Section 4, concludes with policy remarks that follow suit.

2. LITERATURE REVIEW

The above discussion presents the interaction between deficit financing asymmetry and economic growth in Nigeria. Empirical review is essential to recognize the actual change and proportion of economic growth from the effects of deficit financing. There are quite a good number of studies on this subject matter. The following are some of the empirical studies based on their estimation technique and results.

From the empirical studies reviewed, there are mixed views regarding the interaction between deficit financing and economic growth. The inconclusive in the results might be attributable to differences in the analytical technique, variable usage/combination, domain and timeframe. This present study revisits the issue surrounding the presence of deficit financing asymmetry in Nigeria with specific focus on economic growth proxied by industrial production index effect of deficit financing.

3. DISCUSSION AND METHODOLOGY

3.1. Sources of Data

The quarterly data for the years 2000-2019 has been used for our investigation. Industrial Production Index (IPI) is the dependent variable, which measure the general economic activities usually on quarterly and yearly basis. Deficit financing is the major explanatory variable with the inclusion of the variables of tax revenue (REV), savings (SAV) and institutional quality proxied by contract intensive money (CIM) as control variables. CIM is broad money supply minus currency in circulation divide by broad money supply and positively related to income, growth and investment and is use as an indicator of institutional quality (Ubi. & Udah, 2014); (Clague, Keefer, Knack, & Olson, 1999). IPI, DEF, REV, SAV and CIM are all taken from Central Bank of Nigeria Statistical Bulletin respectively.

Table-1. Empirical review.

Author	Country	Objective	Method of Study	Findings
Kasasbeh and Alzoub (2019)	Jordan	Investigate the impact of deficit financing on economic stability	Vector Error Correction Model 2005-2017	Findings reveal that external borrowing and domestic bank financing exert inverse effect on economic stability
Ifeanyi and Umeh (2019)	Nigeria	examine the effect of deficit financing on Nigeria's economic growth	Johanson Co-integration Test - 1981-2016	deficit financing via external debt has a significant negative effect while domestic debt has a positive effect on economic growth
Okah, Chukwu, and Ananwude (2019)	Nigeria	examined the effect of deficit financing on economic growth	Vector Autoregressive 1987 to 2017	Study revealed that deficit financing has positive but insignificant effect on economic growth
Tung (2018)	Vietnam	The effect of fiscal deficit on economic growth in an emerging economy: Evidence from	Error Correction Model (VECM) on the quarterly data of 2003-2016	Fiscal deficit had harmful effects on economic growth in both short and long run
Ali, Mandara, and Ibrahim (2018)	Nigeria	examined the impact of Deficit Financing on Economic Growth	ARDL Technique- 1981 to 2016	Deficit financing had significantly impacted on the output growth
Ubi and Inyang (2018)	Nigeria	appraised fiscal deficit and its implication on Nigeria's economic development	Exploratory Data Analysis 1980 to 2016.	Fiscal deficit has contributed positively to economic growth
Hussain and Haque (2017)	Bangladesh	Examine fiscal deficit (FD) and its impact on economic growth (GDPGR)	Vector Error Correction Model using data from Bangladesh Bureau of Statistics (BBS) and World Bank 1993–1994 to 2015–2016	Based on data from BBS, result reveal positive and significant relationship between FD and GDPGR, while World Bank data reveal negative result between FD and GDPGR
Nwaeze (2017)	Nigeria	examines empirically the relationship between fiscal deficits and macroeconomic stability	VAR estimation methods 1970 to 2016	fiscal deficits have significant negative impact on macroeconomic stability vis-a-viz inflation and exchange rates
Navaratnam and Mayandy (2016)	South Asian of Bangladesh, India, Nepal, Pakistan and Sri Lanka	examine the impact of fiscal deficit on economic growth	Cointegration and Granger causality test to 1980–2014.	fiscal deficit exert negative effect on the economies of South Asian countries exception of Nepal with positive effect
Slimani (2016)	40 Developing Countries focusing on Morocco	Investigate fiscal policy and economic growth	Panel Regression	Findings show that fiscal deficit above the global threshold will likely impact negatively to the economy
Khandelwal (2015)	India	Impact of Energy Consumption, GDP & Fiscal Deficit on Public Health Expenditure in India	An ARDL Bounds Testing Approach	reveal the presence of long run causal relationship between fiscal deficit and GDP
Nayab (2015)	Pakistan	Examines the impact of budget deficit on economic growth	Cointegration technique, VAR Granger causality test and Vector Error Correction model 1976–2007	Finding reveals positive effect and significant relationship between budget deficit on economic growth
Dritsaki (2013)	Greece	Causal Nexus Between Economic Growth, Exports and Government Debt: The case of Greece.	Vector Error Correction Models (VECM) and Granger Causality	The longrun results show that there is a unidirectional Granger causality that runs from economic growth to government debt

3.2. Model Specification

3.2.1. Nonstationarity and Stationarity Tests

The Augmented Dickey-Fuller (ADF) is applied in order to check the integrating properties of the investigated variables. The null hypothesis for ADF is $H_0 : \rho = 0$ while the alternative is $H_1 : \sigma_v^2 > 0$. Z-test is then used for this hypothesis testing in ADF.

3.2.2. NARDL Bounds Test Approach

Following ARDL model, the NARDL approach is as follows:

$$\ln IPI_t = \alpha_o + \delta_1 \ln DEF_t + \delta_2 \ln REV_t + \delta_3 \ln AGS_t + \delta_4 \ln CIM_t + \varepsilon_1 \qquad (1)$$

Where ln denotes the natural logarithms of the variables, and the variables as defined earlier. Based on the studies by Bae and De Jong (2007); Apergis (2015) and the recent study by Usman and Elsalih (2018) we specify the nonlinear ARDL by disintegrating the independent variables into their positive and negative sums as follows:

$$z_t^+ = \sum_{j=1}^{t} \Delta z_j^+ = \sum_{j=1}^{t} \max(\Delta z_j, 0) \ and \ z_t^- = \sum_{j=1}^{t} \Delta z_j^- = \sum_{j=1}^{t} \min(\Delta z_j, 0) \qquad (2)$$

Where z_t represents lnY_t. Δz_t^+ and Δz_t^- are perhaps the sum of the positive and negative shocks in government's deficit financing. The presence of the short-run symmetry $(\beta^+ = \beta^-)$ and long-run symmetry $(\gamma^+ = \gamma^-)$ for all the variables is ascertained by using bounds test and statistical significance. The lag order of the dependent and independent variables is represented by p and q respectively. To examine the long-run asymmetric cointegration among the variables, Shin et al. (2014) proposed two operational tests, which include the bounds testing procedure of Pesaran, Shin, and Smith (2001) through a modified F-statistic (F_{PSS}) with $H_0: \gamma = \gamma^+ = \gamma^- = 0.$ The second test is the t-statistic (t_{BDM}) proposed by Banerjee et al. (1998). The cointegration test is conducted using the level variables. If the computed statistic is greater than the upper bound critical value, the H_0 is rejected, which indicates the existence of a long-run relationship among variables.

The modeling of this study stems from theoretical postulations by Keynes who supported deficit financing to augment domestic resources towards stimulating demand in the economy and that of Classicals economists with contrary opinion. In addition, this study took cue from the empirical work of Tung (2018) who examine the effect of fiscal deficit on economic growth in an emerging economy: evidence from Vietnam using Error Correction Model. From the theoretical postulations and empirical studies of inclusive stand of the impact of fiscal deficit to economy prompt this study to adopt the framework of Nonlinear ARDL as advanced by Shin et al. (2014) to examine this negative-positive effect of fiscal deficit on economic growth in Nigeria and this model is provided in Equation 3:

$$\Delta IPI_t = \alpha_o + \vartheta \ln IPI_{t-1} + \gamma_1^+ \ln DEF_{t-1}^+ + \gamma_2^- \ln DEF_{t-1}^+ + \sum_{i=1}^{p} \alpha_1 \Delta \ln IPI_{t-i} + \sum_{i=0}^{q} \alpha_2 \Delta \ln DEF_{t-i}^+$$

$$+ \sum_{i=0}^{q} \alpha_3 \Delta \ln DEF_{t-i}^- + \sum_{i=0}^{q} \alpha_4 \Delta \ln REV_t + \sum_{i=0}^{q} \alpha_5 \Delta \ln SAV_t + \sum_{i=0}^{q} \alpha_6 \Delta \ln CIM_t + \mu_t \qquad (3)$$

Where α_i represents the short-run coefficients and γ_i represents the long-run coefficients respectively. The first part of Equation 3 estimates the long-run coefficients while the second part estimates the short-run coefficients. Specifically, the positive and negative long-run asymmetric coefficients are computed based on $L_m^+ = -\gamma^+/\vartheta$ and $L_m^- = -\gamma^-/\vartheta$, while the positive and negative short-run coefficients are given as $\sum_{i=0}^{q} \alpha_2 \Delta ln Y_{t-i}^+$ and $\sum_{i=0}^{q} \alpha_3 \Delta ln Y_{t-i}^-$.

4. RESULTS

Table-2. Descriptive Statistics.

Variable	Mean	Std. Dev.	N_Std. Dev.	Skewness	Kurtosis	Jarque–Bera	Probability
IPI	108.33	11.37	0.10	0.09	1.63	6.39	0.04
DEF	1106.27	1194.33	1.08	1.12	2.90	16.91	0.00
REV	6627.19	3144.38	0.47	0.01	1.91	3.98	0.14
SAV	6473.28	5462.02	0.84	0.50	2.04	6.48	0.04
CIM	0.83	0.08	0.09	−0.64	1.94	9.18	0.01

Table 2 above holds the numerical features of the nominal and average variables used in this study. The results show an average growth of 108.33percent, ₦1106billion, ₦6627billion for the series of IPI, DEF and REV while the average growth of the SAV and CIM stood at ₦6, 473billion and 0.83 percent within the period of 2000 to 2019 respectively. For uniformity of the series given their different units of measure, the obtains new standard deviations value, which indicates low volatility for variables of IPI, REV, SAV and CIM exception of DEF, which exhibit moderate fluctuation. As for the distribution of the skewness, the series is roughly equal given the closeness to zero for the variables of IPI, REV, SAV and CIM exception of the series of DEF, which is highly proportional. However, all the series display platykurtic distribution given their kurtosis values of less than three. The Jarque–Bera statistic implying that the series is normally distributed given the validity of the signs of some of the series.

Table-3. Summary of unit root test results.

Augmented Dickey and Fuller (1979); Dickey and Fuller (1981) Test				
	Level (Trend)	Level (Trend & Intercept)	1st Diff. (Trend)	1st Diff. (Trend & Intercept)
LIPI	−0.366157	−4.738048***	−10.68317***	−10.59960***
LDEF	−1.744862	−3.998328**	−8.150759***	−8.095435***
LREV	−1.499804	−2.043458	−3.479730**	−3.473845**
LSAV	−1.619558	−0.979912	−4.223090***	−4.479822***
CIM	−1.762424	−1.297179	−3.032420**	−4.321279***

Notes: ***, ** and * denote 1%, 5% and 10% significance levels respectively.

Table 3 above is the result of the unit root test. The unit root test decision rule state that, the ADF statistic should be at least greater than any of the critical values at 1%, 5%, and 10% respectively. Fundamentally, the study carried out a data diagnostic test using a unit root test to ascertain the order of integration of the series. The Augmented Dickey-Fuller was employ and Table 3 holds that some of the results and variables became stationary

at both level and first difference [that is, I (0) and I(1)]. Hence, the study proceeds with the Non-linear ARDL bound approach to test for the presence of cointegrating associations among the non-stationary series. The lag selection criteria for ARDL test are based on 1, 2, 2, 2, 2 and 2, thus gave rise to the result of the bounds test non-linear ARDL presented in Table 4 below.

Table-4. Bounds Test Non-Linear ARDL.

Model		
F(LIPI/LDEF(NEG), LDEF(POS), LREV, LSAV, CIM)		
Critical value	**Lower bound**	**Upper bound**
1%	3.06	4.15
5%	2.39	3.36
10%	2.08	3.00
F-Statistics	26.87540	
Critical values from Narayan (2005)		

Table 4 above holds the bounds test. The result reveal that the f-statistic stood at 26.87 Non-Linear ARDL, is greater than the critical values at 1%, 5% and 10% respectively. This implies that there exists correlation among the variables under consideration. Given the presence of correlation amongst the variables, long-run relationship can be estimated.

Table-5. Estimated long-run coefficients of deficit financing on Nigerian economy.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDEF_P	-0.072287	0.034010	-2.125443	0.0377
LDEF_N	-0.456686	0.133324	-3.425371	0.0011
LREV	0.002398	0.053779	0.044583	0.9646
LSAV	-0.086800	0.113238	-0.766531	0.4464
CIM	-1.440717	1.352365	-1.065331	0.2910
C	12.16698	1.167905	10.41778	0.0000
ECM(-1)	-0.076895	0.005345	-14.38543	0.0000

Table 5 above holds the estimated results of the long-term equations are mixed. The estimated NARDL model, both positive and negative deficit financing shocks reduces economy growth, which is in line with the findings of Kasasbeh and Alzoub (2019); Ifeanyi and Umeh (2019); Tung (2018); Navaratnam and Mayandy (2016). But the impact of negative deficit financing innovation at 0.45unit is greater than the positive innovation at 0.07unit; indicating deficit is injurious to Nigerian economy and further aligns with monetary theory, who opposed to high deficit financing because of the likely insignificant effect. However, deficit financing matters because sometimes, it comes with technological spillover, technical and managerial capacity that can engender significantly in the economy. In addition, its impact depends on its usage on investment-oriented projects such as infrastructure, power, and the agriculture sector (Dritsaki, 2013).

From the result, a change in revenue would increase economy growth but statistically insignificant thus necessitating government borrowing from both domestic and external source to finance its annual budget. Savings lowers economic growth in estimated NARDL model but its effect is not significant, this is conform to the theoretical underpinning of Chenery and Strout (1966) of low savings in developing economies, thus need for foreign exchange inform of borrowing to augment domestic resources. Quality institution proxied by contract intensive money exerts negative effect and insignificant on Nigerian economy and confirm the existence of inefficient institutions in African countries (Birdsall, 2007; Luiz, 2009; Sule, 2020). This could be reasons for continuous advocacy by European Commission (International Monetary Fund, 2009; Kukk & Staehr, 2015; Raudla & Keel, 2018) for fiscal governance through quality institutions that can drive full implementation of resources.

5. CONCLUSION AND POLICY REMARK

5.1. Conclusion

This study on deficit financing asymmetry and Nigerian economy is motivated by theoretical divergence that deficit financing stimulate aggregate demand and causes inflation. This study is specific on Nigerian economy arising from steady rise in deficits financing occasioned by low inadequate revenue and low savings. In order to determine the path of this relationship, the study examined the validity of the effect of monetary financing to economy in Nigeria from 2000q1 to 2019q4, using Non-linear ARDL technique. The findings of the estimated long-run non-linear ARDL model, both positive and negative changes in monetary financing was found to have asymmetric (magnitude) and negative impact on Nigerian economy whilst the impact of negative deficit financing innovation is greater than the positive innovation. The relationship is statistically significant at 5% and 1%, for positive and negative shocks, respectively. The results of the non-linear ARDL established that deficit financing insulate economic growth in Nigeria, which supports (Cooper & Fisher, 1997) assertions that "deficit financing may stripe growth and development through inflation". In addition, the economy is also driven by weak institutions and low level of savings culture among Nigeria, which is evidence in negative signs of both coefficients.

5.2. Policy Remark

Falling from the above, it is evidence that Nigerian economy is still at the perennial stage that requires adequate resources to boost productivity, this is subject to the direction of resources. It is proven that what is required is fiscal authorities to monitor full implementation of resources both from domestic and external sources. This now reaffirms the continuous advocacy of fiscal governance framework.

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