ASYMMETRIC RESPONSE OF FISCAL SUSTAINABILITY TO THE FINANCIAL DEVELOPMENT IN NIGERIA

Abstract

This study examines the asymmetric response of fiscal sustainability to financial development in Nigeria while augmenting the model with exchange rate volatility within the non-linear autoregressive distributed lagframework. The empirical evidence reveals that positive and negativeshocks in domestic credit to private sector results in significant unsustainable fiscal balance and fiscal sustainability both in the short run and long run respectively. Increase and decrease in annual market capitalization have a positive and negative significant impact on the fiscal sustainability in the long run respectively. Exchange rate devaluation or depreciation has a devastating effect on fiscal sustainability both in the short run and long run. Wald test revealed thatcredit to the private sector and annual market capitalization have an asymmetric effect on fiscal sustainability both in the short run and long run, while the exchange rate has no asymmetric effect on fiscal sustainability. For a sustainable fiscal stance, we recommend a financial model that channels credits towards productive activities to boost GDP as this will go a long way in reducing the debt-to-GDP ratio and enhancingsolvency.

Keywords: fiscal sustainability, market capitalization, domestic credit, asymmetric, NARDL

JEL Classification Code: E62, F34, C22

UNDER PEER REVIEW

1. Introduction

Nigerian fiscal behaviour recently exhibits persistent and concurrent imbalances and rising debt level respectively. In 2021 for instance, the average fiscal deficit as a percentage of GDP was 3.67% while the debt to gdp ratio rises from 29.10% in 2019 to 34.98.47% in 2020 (IMF, 2020). The debt level in particular has raised a serious concern among policymakers in the country. Strong fiscal sustainability requires low debt profile with constant flow of the debt servicing without lag effect on the infrastructural development. The current fiscal crisis experienced today was the consequence of what Wagner described as continuous rise in government spending on

social, economic, security and administrative activities (Jaen, 2018). When government public debt overhang, then economic agents will be skeptical about the ability of government to repay back in future, such speculation can cause serious distortion in the financial market in the long run. Dual role of finance house in this respect cannot be overemphasized, raising the debt to finance deficit is a direct function of well-developed financial system, regulatory body ensure that the action of government does not result to inflationary tendency and dynamics of the monetary policy rate guide the fiscal stance. An oil rich country like Nigeria will achieve fiscal sustainability only if it developed a public finance system that utilized the oil revenue to finance the deficit in the annual budget as envisaged by (Aslanli, 2015). Sovereign oil wealth fund will play a significant role in this respect if properly managed to tackle a fiscal challenge that may emanate from internal and external shocks.In the literature, one of the most used indicators of the fiscal sustainability is the public debt to GDP ratio, allowing this indicator to grow overtime has an important policy implication on sustainability and this has become the major characteristics of most developing economies like Nigeria (Cruz-rodríguez, 2014).

It is notable that literature is silent on the effect of the public sector borrowing on the financial development in Nigeria. Huge internal borrowing has a potential to harm the financial system especially the solvency and liquidity of banks in the long run. However, this is insignificant compare to the external borrowing, but reducing the external borrowing and concentrating on the internal borrowing to a large extent depend on the well-developed financial system this is because the cost of external borrowing outweighs that of domestic borrowing, impliedly, this will go a long way in reducing the pressure on fiscal balance. In line with this thought, we developed a model that empirically examine the cumulative effect of the positive and negative shocks of the financial development on the fiscal sustainability.

This study is structured into four sections; second part dwell on the related literatures and underpinning theories, third, fourth and fifth section sections presents the methods, results/discussions and conclusions/recommendations respectively.

2. Review of Related Literature

The theory underpinning this study is anchored on the popular Wagner's Law of government spending. The law of fiscal requirements expansion and increasing state activities which was developed by Adolf Wagner in 1876 which state that the share of public expenditure to national

UNDER PEER REVIEW

income increases “extensively” and “intensively” as a result of an industrialize economy. The law further noted that social progress has led to an increase in state activities that result to the increase public expenditure. The law also confirmed that sustainable fiscal policies or increase in the ratio of government expenditure result to the rises of national income due to the rises in capita income. Moreover, the reasons given by Wagner’s law are firstly, expansion of the economy which associated with urbanization and industrialization which would complement additional needs that beyond traditional defense and legal system. Secondly, the grows of real income is associated with cultural and welfare expenditure. Thirdly, the economic development and technological changes is due to government spending that complement the private sector funding for long-term investment.

Since Keynes departure from the classical thought in 30s, literature on fiscal policy went viral for several years. Complexity in government activities lead to the question of Fiscal sustainability in modern day economy. Its link with financial development was rarely explored extensively in the literature. Recently, Adebisi and Salako (2020) investigate fiscal policy sustainability in Nigeria using ARDL bound testing approach for the period between 1961 and 2016. The result reveals unstable fiscal policy in the country over the period of the study because government spending in productive activities is inadequate to serve as investment. More so, no cointegration exists between public revenues and expenditure, and a uini-directional causality run from public revenues to expenditure in Nigeria.

The error correction modeling employed by Muzanda (2014) assesses fiscal sustainability in South Africaempirically, the study confirmed that adjusting primary deficit or surplus in response to variation in debt positions government will maintain its sustainable fiscal policy. Akintola, Oji-okoro and Itodo (2020) re-examined the interaction effect of financial development and economic growth in Nigeria using ARDL model and found that the interaction effect all share index, financial deepening and banking liquidity system has a positive and significant long run to output growth rate in Nigeria. Hence, there is a consistent falling of real output growth rate due to the behaviour of real exchange rate. COVID-19 pandemic reduces employment and consumption in both formal and informal sectors.

Sennoga and Balma (2022) provided a frame work for assessing the fiscal sustainability in the era of post COVID-19 recovery through public finances. The finding reveals that the scales back

UNDER PEER REVIEW

of consumption contraction lead to an economic recession and widening fiscal and current account deficits. This study has focused in examining the fiscal sustainability in Southern African countries. The result found that the formal condition was not fulfilled due to the explosive growth of debt slowdown in Namibia and Zimbabwe. However, sustainable fiscal policies in Angola, Malawi and Bostwana were invulnerability in the recent unfavourable macroeconomic developments in Africa. For the rest of the countries the results are mixed as posits from the work of Mackiewicz (2015). For example, Evans (2020) observed a negative but significant relationship in both short-run and long-run running to corruption, policy uncertainty and fiscal deficit to financial development and economic growth. Hence, financial development and economic growth reduced to the lower level as a result of higher levels of corruption, policy uncertainty and fiscal deficit in Nigeria. Also, debts have a significant negative relationship in the long-run with financial development, whereas; budget reforms have positive and significant relationship with financial development in the long-run, meaning that unsustainable fiscal policy have effects on financial development in the long-run.

Saibu (2018) argues that the empirical evidence of this study reveals no deviation from extant studies in the literature. Because weak sustainability run both from fiscal sustainability to economic performance and vice versa from the result reported in the Dynamic ordinary least squares regression results. In assessing fiscal sustainability in some selected developing and emerging countries using recursive algorithm by Rodriguez (2014) conclude that large unsustainable fiscal policies observed under the period covered in the study as explained by primary fiscal deficits. Similarly, the study conducted by Shuaibu (2021) in measuring the effects of fiscal prudence and financial development on foreign direct investment inflow in Nigeria using Log linear and ARDL bound testing approach reveals statistically significant of domestic credit to private sector, foreign reserve, capital formation and financial development in Nigeria. The result from log linear model is positive and may be connected with the short-run ARDL model result, but foreign reserve as proxy of financial prudence is statistically significant in the case of ARDL model analysis.

3. Methodology

3.1 **Dataset**

UNDER PEER REVIEW

To empirically investigate the asymmetric response of fiscal sustainability to financial development in Nigeria, we collect annual time series data from the from the CBN statistical bulletin (2022). The data ranges from 1981 to 2021. The choice of the period was explained by data availability. We use two most widely used proxy of financial development in literature. Firstly, credit to private sectors by financial institutions which represents the banking sector financial development, secondly, annual market capitalization that stood for the financial market development. Fiscal sustainability is proxy by debt to gdp ratio following Blanchard et al. (1990); Cruz-rodríguez, (2014); Keliuotyt, (2015); IMF, (2002); Croce et al., (2003). Exchange rate was introduced in to the model as control variable due to its encompassing role in the economy in general and debt services in particular.

Table 1.Variable Measurement

S/N	Variable Name	Code	Definitions	Source
1.	Public debt to GDP ratio	DB_GDP	This is a measure of fiscal sustainability. Blanchard et al. (1990) sees fiscal sustainability as a policy that ensure the ratio of debt to Gross National Product (GNP) eventually converges back to its initial level.	CBN (2022)
2.	Annual market capitalization	MKT	This represents the financial market indicator. It is simply the annual market capitalization in billion naira.	CBN (2022)
3.	Credit to private sector.	CPS	This is financial institutions indicator. It represents the amount of money readily available for disbursement to private sectors at predetermined interest rate.	CBN (2022)
4.	Exchange rate	EXCH	We introduced exchange rate as a control variable. it is naira-dollar exchange rate annual average.	CBN (2022)

3.2 **Model Specification and Modeling Approach**

In scientific literature, there are three different approaches to fiscal sustainability modelling. First approach as extended by IMF (2002); Croce et al., (2003); focus on solvency i.e. the economy's ability to service debt as at when due. The second approach put forward by Buiter (1985) suggests that the debt to GDP ratio converges to its initial level in the long run. Final approach suggested by Alvarado (2004) combine both first and second approach.

UNDER PEER REVIEW

In this study, we adopt and modified the econometric approach to solvency extended by (Budina & Wijnbergen, 2008). The approach serves as quantitative underpinning of this paper. It begins with the intertemporal public sector noninterest income.

$$\alpha_0 + \sum_{1}^{\infty} \frac{g_i}{(1+r)^i} = \sum_{1}^{\infty} \frac{t_i + s_i}{(1+r)^i}, \alpha_0 = \sum_{1}^{\infty} \frac{t_i + s_i}{(1+r)^i} \quad eq.1$$

Equation states that summation of debt at the initial period α_0 and discounted value of the non-interest government spending g_i should equals to public sector non-interest revenue which further equals to sum of tax revenue t_i and seigniorage incomes, s_i.

The flow budget constraint equation can be written as;

$$\alpha_t = \alpha_{t-1}(1+r) - (ps_t + s_t) \quad eq.2$$

Solvency in this respect requires that we substitute equation 2 repeatedly in itself, for t starting at 0.

$$\alpha_0 = \frac{ps_1 + s_1}{1+r} + \frac{\alpha_1}{(1+r)^1}$$

$$= \frac{ps_1 + s_1}{1+r} + \frac{ps_2 + s_2}{(1+r)^2} + \frac{\alpha_2}{(1+r)^2}$$

$$= \lim_{t\to\infty} \sum_{1}^{t} \frac{ps_i + s_i}{(1+r)^i} + \lim_{t\to\infty} \frac{\alpha_t}{(1+r)^t} \quad eq.3$$

However, from the above, solvency requires linear combination of equation 3 and 1

$$\lim_{t\to\infty} \frac{\alpha_t}{(1+r)^t} = 0. \quad eq.4$$

In a nutshell, the limiting value of equation 4 indicates the debt should not grow faster than the rate of interest.

3.3 Non-linear Autoregressive Distributed Lag Model (NARDL)

Prior to estimation of asymmetric cointegration model, the data will be examined for presence of unit root or otherwise. The essence is to satisfy the condition set by shin et al (2001) that time

UNDER PEER REVIEW

series under investigation should exhibit integration process of I(0), I(1) or combination of both. In other words, none of the series should be integrated of order two. In this study we employed ADF unit root test on one hand and Guris (2019) test of unit root by observing nonlinearity of the variables. This is evident in shin et al (2014) that most of the macroeconomic variables follow non-linear stochastic process.

The choice of NARDL model is explained by its robustness in the presence of small sample size, secondly, in line with the objective of this study, thirdly, symmetric model such as ARDL produces estimates that are not robust and consistent. (Anderson et al., 2014).

The model allows for decomposition of the explanatory variables into positive and negative partial sum, this help in examining the asymmetric effect of either on the dependent variable. for example, our dependent variables in this respect i.e. credit to private sector, market capitalization and exchange rate can be observed as $\Delta cps^{+}$and Δcps^{-}, $\Delta mkt^{+}$and Δmkt^{-} and $\Delta exch^{+}$and $\Delta exch^{-}$ respectively. However, the functional asymmetric cointegration relationship can be formulated as;

$$DB\_GDP_t = f(cps^{+}, cps^{-}, mkt^{+}, mkt^{-}, exch^{+}, exch^{-}) \quad eq.5$$

Where; DB_GDP_t is the debt to GDP ratio at time t as well the proxy for fiscal sustainability, $cps^{+}$is the positive change in the credit to the private sector, cps^{-} is the negative shock to the credit to private sector by financial institutions, mkt^{+} is the positive shock to the market capitalization, mkt^{-} is the negative change, $exch^{+}$ and $exch^{-}$ are rise and fall in exchange rate respectively.

Following shin et al. (2014) we expressed asymmetric cointegration equation as;

$$\begin{aligned}\Delta DB\_GDP_t = {} & \gamma DB\_GDP_{t-i} + \delta_1{}^{+} cps_{t-i}{}^{+} + \delta_2{}^{-} cps_{t-i}{}^{-} + \delta_3^{+} mkt_{t-i}^{+} + \delta_4^{-} mkt_{t-i}^{-}{}_{t-1} + \delta_5^{+} exch^{+}{}_{t-i} \\ & + \delta_6^{-} exch^{-}{}_{t-i} + \sum_{i=1}^{\rho} \alpha_1 \Delta DB\_GDP_{t-i} + \sum_{i=1}^{\rho} \alpha_2{}^{+} \Delta cps_{t-i}{}^{+} + \sum_{i=1}^{\rho} \alpha_3{}^{-} \Delta cps_{t-i}{}^{-} \\ & + \sum_{i=1}^{\rho} \alpha_4{}^{+} \Delta mkt^{+}{}_{t-i} + \sum_{i=1}^{\rho} \alpha_5{}^{-} \Delta mkt^{-}{}_{t-i} + \sum_{i=1}^{\rho} \alpha_6{}^{+} \Delta exch^{+}{}_{t-i} \\ & + \sum_{i=1}^{\rho} \alpha_7{}^{+} \Delta exch^{-}{}_{t-i} + \varepsilon_t \quad eq.6\end{aligned}$$

Equation 6 specified above accord us opportunity to test for asymmetric cointegration, long run and short run asymmetric effect of financial development and exchange rate on fiscal sustainability, lastly, explore their long run and long run asymmetries coefficient as decomposed in (6) above. However, the asymmetric error correction version of equation 6 can be expressed as;

UNDER PEER REVIEW

$$\Delta DB\_GDP_t = \sum_{i=1}^{\rho} \alpha_1 \Delta DB\_GDP_{t-i} + \sum_{i=1}^{\rho} \alpha_2{}^{+} \Delta cps_{t-i}{}^{+} + \sum_{i=1}^{\rho} \alpha_3{}^{-} \Delta cps_{t-i}{}^{-} + \sum_{i=1}^{\rho} \alpha_4{}^{+} \Delta mkt^{+}{}_{t-i} + \sum_{i=1}^{\rho} \alpha_5{}^{-} \Delta mkt^{-}{}_{t-i} + \sum_{i=1}^{\rho} \alpha_6{}^{+} \Delta exch^{+}{}_{t-i} + \sum_{i=1}^{\rho} \alpha_7{}^{+} \Delta exch^{-}{}_{t-i} + ECT_{t-1} + \varepsilon_t$$

4. Results and Discussions

Before using the data for empirical estimation, we verified the characteristics of the data using measure of central tendency and dispersion. The results are reported in table 2 where debt to GDP ratio, credit to private sector, market capitalization and exchange rate have means of 0.315579, 6571.298, 7278.830 and 108.1675 respectively. Market capitalization has the highest average and variability as shown by greater standard deviation value. Debt to gdp ratio recorded the highest and lowest ratio of 0.797133 and 0.071171 during the period under investigation. The maximum credit extended to private sectors by financial institutions stood at about 32868.49 billion naira as against the minimum of 8.5billion naira. The market capitalization is reported to has greater value of about 42054.50billion and lowest of about 5 billion naira in 1981 and 2021 respectively.

A normal skewness stood at zero-point, deviation from that make data skewed to the left or right, all the variables exhibit high positive skewness and a little bit far away from the origin. Jarque bera statistics shows thatwith exception of debt to GDP ratio that exhibit normal distribution at 10% level, all other variables lead us to reject the null hypothesis of normal distribution.

In table 3, we report the pairwise correlationcoefficients among the variables, the results show that debt to gdp ratio has a moderate negative correlation with credit to private sector, market capitalization and exchange rate. Credit to private sectors has high positive correlation with market capitalization and exchange rate, while exchange rate is strongly correlated with the market capitalization.

Table 2. Descriptive Statistics

Statistics	DB_GDP	CPS	MKT	EXCH
Mean	0.315579	6571.298	7278.830	108.1675

UNDER PEER REVIEW

Median	0.240907	764.9615	662.5000	111.9433
Maximum	0.797133	32868.49	42054.50	399.9636
Minimum	0.071171	8.570050	5.000000	0.610025
Std. Dev.	0.230643	9588.542	10795.89	109.9115
Skewness	0.762380	1.297453	1.637725	0.972937
Kurtosis	2.190524	3.388889	5.155610	3.172454
Jarque-Bera	5.091075	11.76149	26.26601	6.519282
Probability	0.078431	0.002793	0.000002	0.038402

Table 3. Correlation Matrix

	DB_GDP	CPS	MKT	EXCH
DB_GDP	1	-0.5065	-0.5017	-0.4777
CPS	-0.5065	1	0.9685	0.9296
MKT	-0.5017	0.9685	1	0.9181
EXCH	-0.4777	0.9296	0.9181	1

Table 4. ADF Unit Root Results

Variable	Intercept	Intercept and trend	Inference
DB_GDP	-1.908734	-2.765534	Not stationary
CPS	5.7226761	1.650518	Not stationary
MKT	2.856728	0.700886	Not stationary
EXCH	2.714012	0.068481	Not stationary
ΔDB_GDP	-4.306050*	-4.286674*	Stationary
ΔCPS	0.715594	-5.070345*	Stationary
ΔMKT	-4.925795*	-5.895441*	Stationary
$\Delta EXCH$	-4.074830*	-4.776618	Stationary

Notes: * & ** signifies significant at 1% and 5% respectively

In time series analysis, it is a tradition and requirement for estimation to establish the stationary status of the data under investigation, in line with this, we utilized the popular augmented dickey fuller unit root test. the test is carried out using intercept as well intercept and trend on the level data and first difference data. The null hypothesis for the test demonstrates unit root on a series against the alternate hypothesis, using the probability value as against the critical table value, a test with probability value less than 5% lead to rejection of the null hypothesis. Critical look at table 4 depicts that all variables contain unit root in their raw form. When converted to the first difference, they become stationary at 1% level. This led us to conclusion that all the variables under consideration are integrated of order one. In line with Pesaran et al.(2001) that linear

UNDER PEER REVIEW

combination of the I(1)s, I(0)s, or mixture of both can yield unbiased cointegrating vector. In this case we can test for cointegration within the framework of bound testing.

Table 5. Guris (2019) Non-Linear Unit Root Result

Variables	Lags	Test statistics	Decision	Critical values	
DB_GDP	3	8.148047	Nonlinear stationary	1	20.32
CPS	3	28.63276*	Stationary	5	14.72
MKT	3	7.598751	Nonlinear stationarity	10	12.32
EXCH	3	3.617423	Nonlinear stationarity		

Note: *, ** & *** refers to the rejection of unit root hypothesis at 1%, 5% & 10% level respectively, lag method (AIC), maximum lags (3)

In table 5, the result of the Guris (2019) nonlinear unit root is reported, the null hypothesis of unit root cannot be rejected for debt/GDP ratio, market capitalization and exchange rate. Credit to private sector exhibit nonlinear stationarity at 1% level.In other words, the three variables demonstrated nonlinear stationarity structure, while CPS has linear stationarity structure. See (Harvey et al 2008; Kruse 2011) for expanded models and asymptotic assumptions.

Having established that the variables are integrated of order one, we test for cointegration using bound test from the NARDL estimates. We hypothesized that there is no long run relationship among the variables and vice versa.Table 6 report the bound test f-statistics where we reject the null hypothesis at one percent level. This means that fiscal sustainability proxy by debt to gdp ratio, credit to private sectors, market capitalization and exchange rate have a mutual interactive effect in the long run.

Table 6. Fiscal Sustainability Baseline Model Results (NARDL Estimates)

Long Run Estimates		
Variables	Coefficients	Standard Error
CPS_POS	-0.011985**	0.004497
CPS_NEG	0.091403**	0.034050
MKT_POS	0.005824**	0.002265
MKT_NEG	-0.016717	0.006826
EXCH_POS	0.035600**	0.013133
EXCH_NEG	-1.051155	1.065053
C	0.530511*	0.062338
Short Run Estimates		
Variables	Coefficients	Standard error
D(DB_GDP(-1))	0.268295**	0.102499
D(CPS_POS)	-0.001860*	0.000171

UNDER PEER REVIEW

D(CPS_NEG)	0.048199*	0.004627
D(MKT_POS)	-0.000156*	3.690000
D(MKT_NEG)	0.000613*	0.000149
D(EXCH_POS)	0.011287*	0.000708
D(EXCH_NEG)	-0.455245*	0.043457
Ecm	-0.436302*	0.042152
Bound test (F-statistics)	5.580063*	
BP Serial Correlation Stat	5.929236	
BPG Heteroskedasticity Stat	1.023022	
Normality test (J-bera statistics)	103.6770*	
CUSUM Test	Stable	
CUSUM of Squares Test	Stable	

Notes: * & ** Signifies Significant at 1% and 5% respectively

In table 6, the baseline model results depict that in the long run increase in the credit to the private sectors has a significant negative effect on the fiscal sustainability in the country, while decrease in the credit to the private sectors has a significant positive impact on the fiscal sustainability. This is evident in the financial reforms geared towards social safety net that abrogate a considerable resource to commercial banks for outright disbursement to the individuals inform of low or interest free loans to stimulate a particular sector of the economy. We witness in the recent past the huge resources channeled towards revamping the economy in different sector, this may likely have a distressing impact on the fiscal stance. Positive shock from market capitalization has a significant positive impact on the fiscal sustainability while decrease market capitalization will reduce the fiscal sustainability although not statistically significant.

Further examination of table 6 reveals that exchange rate appreciation has a positive and significant effect on fiscal sustainability, conversely, negative shock on exchange rate that lead to devaluation has a significant negative impact on the fiscal sustainability in the country. This finding is giving backing to the a priori expectation and practice. The more naira lost its value in relation to the foreign currency, the more money will be earmarked and extended for debt servicing, consequently weakening the fiscal sustainability in the country.

In the short run, fiscal sustainability response positively to the first period lag of itself, while response negatively to the increase in credit to the private sector and significant at 1%, although the magnitude of the effect is bigger in the long run. However, the response is significantly positive to the fall in the amount of the credit to the private sector. Rise in the market

UNDER PEER REVIEW

capitalization in the short run has a negative significant impact on the fiscal sustainability, this is a departure from the long run coefficient. A negative market shock exerts a significant positive effect on the fiscal stance. Directing more investment on the FG bonds may likely fine-tune the fiscal stance meanwhile other equities experience low investment, however, such positive impact on fiscal sustainability is unconnected with low activities in the stock market resulting from more investment on the bond that attract fixed return in a short period. The behaviour of exchange rate remains the same both in the short run and long run. The error correction term or speed of adjustment term is expected to have a negative coefficient, less than one and statistically significant. As shown in the table, the coefficient satisfies the criteria, this implies that the speed of adjustment to the long run equilibrium in case of distortion or shock in the economy is at 43.6% annually.

Post estimation test reported at the bottom of the table revealed how the model fit well. Breusch Pegan serial correlation test shows that the model is free from serial correlation. In the same vein, BPG and Jarque Bera statistics indicate that the estimated model has a constant variance and the residuals of the model are normally distributed respectively. Figure 1 and 2 in the appendix shows the results of the CUSUM of square test and CUSUM test respectively. With a little distortion away from the 95% confidence interval lines, we can conclude that coefficients of the model are stable.

Table 7. Asymmetric Test Results

Variable	Test Statistic	Inference
Long Run		
CPS	7.994924**	Asymmetric Effect
MKT	5.947765***	Asymmetric Effect
EXCH	1.203556	No asymmetric effect
Short Run		
CPS	10.19381**	Asymmetric Effect
MKT	7.572117**	Asymmetric Effect
EXCH	1.933173	No asymmetric effect

Notes: * & ** Signifies Significant at 1% and 5% respectively

Using Wald test of coefficient restrictions on the estimated NARDL model, we test whether response of the fiscal sustainability proxy by debt to GDP ratio to financial development indicators (i.e. credit to private sector and stock market capitalization) and exchange rate is asymmetric. The outcome of the test is reported in table 7, credit to private sector by financial

UNDER PEER REVIEW

institutions are found to have asymmetric effect on the fiscal sustainability both in the short run and long run. Contrarily, exchange rate has no asymmetric effect on the fiscal sustainability in the short run and in the long run.

5. Conclusions

In this study, we examine the response of fiscal sustainability to financial development in Nigeria using asymmetric cointegration model extended by shin et al (2014). The stationary status of the time series data was established using traditional ADF method and non-linear unit root test proposed by Guris (2019). The series under investigation were found to be stationary only after first difference. The result of bound test indicates that debt to GDP ratio, credit to private sector, market capitalization and exchange rate have a long run relationship. Findings emanating from the long run coefficient of the asymmetric cointegration model show that fiscal sustainability has a significant negative relationship with the positive shocks from the credit to private sectors by financial institutions and positive to the negative shocks. Rise and fall in annual market capitalization have a positive and negative significant impact on the fiscal sustainability respectively. We equally found that exchange rate devaluation or depreciation has a devastating effect on fiscal sustainability both in the short run and long run.

Further, Wald coefficient restriction test suggests that credit to private sector and annual market capitalization has asymmetric effect on fiscal sustainability both in the short run and long run, while exchange rate has no asymmetric effect on the fiscal sustainability. The findings here provide basis for conclusion that reaction of fiscal policy to financial development is asymmetric. The empirics from this study revealed that financial boom pose a threat to fiscal sustainability in Nigeria. Tax and equity manipulation will provide succor to the fiscal space if pursue with all sincerity. Economic performance is inimical to the fiscal sustainability and debt capacity, but composition of the economy itself may not sustain current government spending in the face of the falling value of naira against foreign currency. In accordance with the findings of this study, we therefore recommend that government should be cautious of its unproductive expenditure and maintain fiscal discipline that ensure reduction in both internal and external debt so that the debt to gdp ratio can be sustain.

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UNDER PEER REVIEW

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UNDER PEER REVIEW

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Appendix

UNDER PEER REVIEW

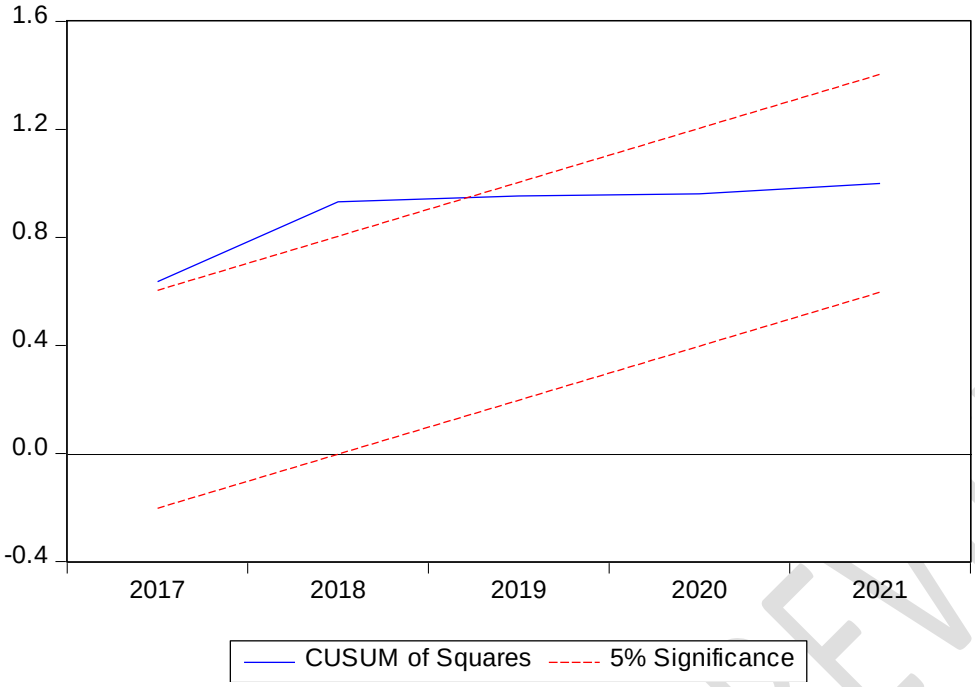

Figure 1: CUSUM OF SQUARES

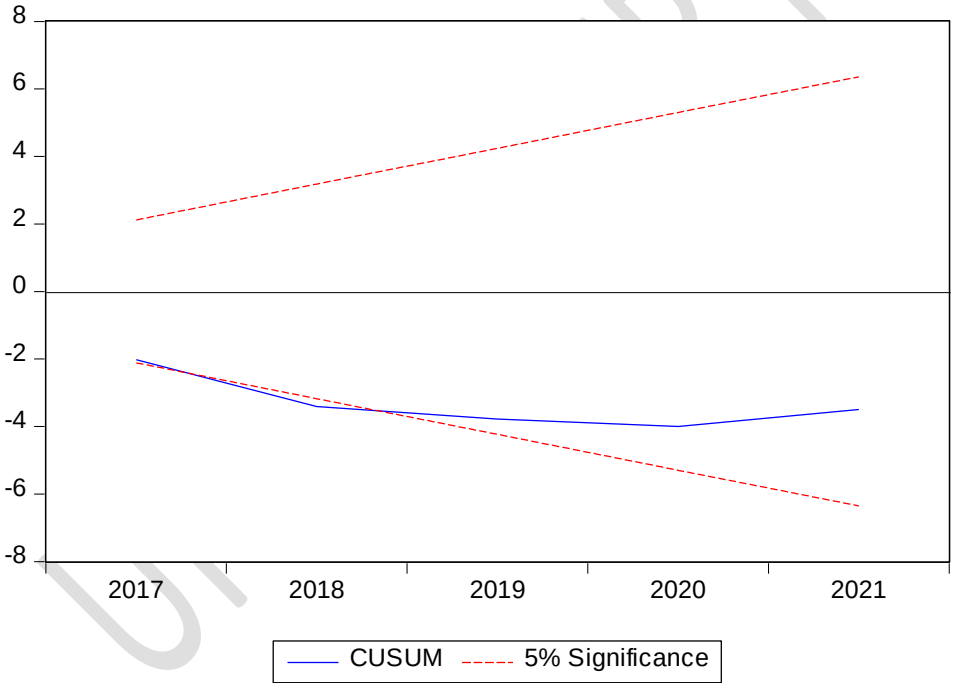

Figure 2:CUSUM TEST