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Impact of Budget Deficit Financing and Macroeconomic Attributes on Financial Sustainability in Nigeria

Ja'afar, Yusuf[1], Adamu, Sa'idu[2] and Shehu, Usman Hassan[3]

[1]*Department of Accounting, Faculty of Management Sciences, Federal University Kashere (FUK), Gombe State Nigeria. E-mail: jaafaryusuf2015@gmail.com*
[2]*Department of Accounting, Faculty of Management Sciences, Federal University Kashere (FUK), Gombe State Nigeria. E-mail: saidugembu@gmail.com*
[3]*Department of Accounting, Faculty of Management Sciences, Federal University Kashere (FUK), Gombe State Nigeria. E-mail: shehu.hassanus.usman@gmail.com*

Abstract: The pursuits for sound economic growth, national development and financial sustainability have become the bane of Nigeria and thus, lingering over the years despite the abundant natural, human and material endowments. This study examines the effect of budget deficit and macroeconomic attributes on financial sustainability in Nigeria. The study used ex-post facto as the research design for the study. Indeed, the study employed quantitative and critical realism as the research approach and paradigm of the study respectively. The data for the study was obtained from the secondary sources of data collection. Nigerian economy was employed as the domain and population of the study using fourty (40) years spanning from 1982 to 2022 as the period of the study. To analyze data, the bounds test for co-integration, the ARDL estimation techniques were jointly employed. Based on the result of ARDL for long-run co-integration, it clearly states that all the regressors (EXTD, EXRS, DBS, EXR and CPI) have a long-run co-integration with financial sustainability as measured by Debt-GDP. It is recommended amongst others, that government borrowings through external debt and debt servicing arrangements should be tailored to tackle critical and physical infrastructures while the apex bank should deploy a holistic approach designed at tackling the fluctuation in the general price level as measured by the (CPI), promoting local production and investment through empowering the small and medium scale enterprises in order to boost productivity, create more jobs, attract foreign investors, encourages export and finally reducing the over reliance on crude oil revenue.

Keywords: Deficit Financing, External Debt, Debt Overhang, Fiscal Illusion, Nigeria.

1. Introduction

Financial sustainability has been a trending and challenging issue amongst both developed and emerging market economies. Many countries have been battling to build a sound and consistent financial stance in order to cater for their short-term, medium-term and long-term economic goals and objectives. The ability of a

country to tackle its current financial obligation without jeopardizing its medium and long-term financial obligations is highly needed in order to achieve its desired economic goals objectives (Alagoa *et al.,* 2023). To achieve the aforementioned objectives, a reasonable level of equilibrium must be attained between the proportion of debt and gross domestic productivity (Okodua *et al.,* 2022).

Over the years, budget deficit financing especially in a transition economy like Nigeria have been mismatched with the required outcomes (emergence of sound economic growth, National development and/or financial sustainability by extension). Specifically, the level of external debt, external reserve, debt servicing, exchange rate and consumer price index (CPI) have been central to this issue and hence, dominated the public budget deficit financing and macroeconomic derivatives in Nigeria (Alagoa *et al.,* 2023).

Accordingly, it was argued by scholars that the level of a country's financial sustainability may not be unconnected with the quantum of external debt which is tailored to finance critical infrastructures especially in a developing economy like Nigeria. This is based on the fact that the level of external debt if efficiently utilized into productive activities could have the tendency of generating revenues (returns from investment), promoting local production of goods and services, attracting local and foreign investors as well as encouraging export of locally manufactured raw materials (Yusri *et al.,* 2019). On the contrary, the level of external debt if huge and poorly utilized may crystallize local investment as little or no amount of funds is left to finance productive activities. This scenario may trigger foreign investors to flee away from the country thereby adversely affecting the GDP growth rate and ultimately, the financial sustainability at large. Hence, the level of interest rate charged on external borrowing is normally high which was argued by scholars to be counter-productive and a constraint to financial sustainability as proxied by Gross Domestic Product (GDP). It is based on this argument that external debt is expected to have significant co-integration on financial sustainability in Nigeria.

External reserve is another striking variable that is linked to financial sustainability of a country especially in an emerging market economy like Nigeria. Scholars in the academics were of the opinion that a country with huge external reserve may likely be associated with favorable balance of payment and huge volumes of export. This could automatically reflect on the Nigeria's level of aggregate output (GDP) amidst era of pursuing financial sustainability. Thus, the quantum of external reserve at a reasonable level may serve as a backup or inducement towards productivity growth and hence, could trigger financial sustainability of a country.

Debt servicing is one of the characteristic feature of a developing economy especially those countries that are battling with high security challenges, excessive deficit financing amongst other socio-economic and political issues. Nigeria, being the giant from the African continent is no longer an exception to this scenario. It is normally measured as the proportion of debt to revenues. The small the debt-revenue proportion, the higher the level of financial sustainability. On the contrary, higher debt-revenue ratio could serve as a signal for credit default and consequently, a declining financial sustainability of the country. Hence, it is expected that debt service could have strong impact on financial solvency in Nigeria.

Exchange rate is another explanatory variable which is expected to influence the level of financial sustainability in Nigeria. This is rooted from the fact that the persistent dominance of the foreign currencies like the USD ($), the British Pound sterling (£) among other hard currencies over and above the local currency is worrisome and may constitute a devastation to the economy at large. It was contended that if the local currency loses it value relative to the foreign currencies, the end result is fluctuations in the foreign exchange market due to the incessant volatility in the exchange rate. Therefore, exchange rate whether favorable or unfavorable, may impact significantly on financial sustainability in Nigeria.

Inflationary level as surrogated by Consumer Price Index (CPI) has been one of the major lingering issues bedeviling the people and countries especially the low income earners in the society and developing economies respectively. It is one of the macroeconomic attributes characterized with persistent rise in the general price level, too much money in circulation among other issues. It was argued by economist that the level of CPI if goes beyond the normal level, is capable of discouraging local production of goods and services, causes excessive deficit financing and balance of payment disequilibrium etc. These could have a detrimental effect on the country's productivity level and ultimately reflect on its financial sustainability. Therefore, CPI is perceived to have both short and long-runs impact on financial sustainability in Nigeria.

It is noteworthy that the Federal Republic of Nigeria is divided into six geopolitical zones, thirty-six (36) states, and seven hundred and seventy-four (774) local councils with its Headquarters positioned in Abuja as the Federal Capital Territory (FCT). The most noticeable location is Zuma Rock; a 725m-tall monolith at the out-sketch of FCT Abuja that's captured on the country's currency. It is the largest black African country and the sixth (6) richest oil producing country in the world. Nevertheless, the country's quests for sound economic growth, national development and financial sustainability have become

the bane of Nigeria and thus, lingering over the years despite the abundant natural, human and material endowments.

There are conflicting opinion regarding public expenditure influences on financial sustainability. The country is presently facing an economic slump as a result of declining oil revenue, under which the country depends for its survival. Nevertheless, the alarming rate of financial misappropriation touches the country's quest to meet up with Sustainable Development Goals (SDGs). Governments continue to raise expenditure on infrastructure in order to boost economic growth and financial sustainability to ease the burden of its growing population. In particular, good transportation, communication and quality education should be obtainable, citizen should enjoy good healthcare system at affordable costs and there should be no hunger, well secured environment but, paradoxically, this is entirely different in the Nigerian context. The issue is that the economic advancement achieved has not reflected into enhanced wellbeing as anticipated in other countries. It was against this backdrop that this study attempted to examine the impact of budget deficit financing and macroeconomic attributes on financial sustainability in Nigeria.

Based on the practical and theoretical issues highlighted earlier, the following research questions were formulated in order to provide a guide to the study with a view to providing solution to the problems identified in the study. Thus; What is the impact of budget deficit, macroeconomic attributes on financial sustainability in Nigeria? Consistent with the research questions formulated, the main objective of this study is to examine the impact of budget deficit financing and macroeconomic attributes on financial sustainability in Nigeria. Other specific objectives are to:

(i) Examine the effect of external debt on financial stability in Nigeria;

(ii) Investigate the effect of external reserve on financial stability in Nigeria;

(iii) Ascertain the influence of debt servicing on financial stability in Nigeria;

(iv) Examine the impact of exchange rate on financial sustainability in Nigeria;

(v) Find out the influence of inflation rate (CPI) on financial sustainability in Nigeria.

In tandem with the objectives of the study, it was hypothesized that budget deficit financing and macroeconomic attributes have no significant impact on financial sustainability in Nigeria. This study examined the effect of budget deficit and macroeconomic attributes on financial sustainability in Nigeria. Indeed, the

study was conducted for a period of fourty (40) years spanning from 1983 to 2022. The selection of this time-horizon might not be unconnected with the series of political and socio-economic events that have taken place during the study period. Other subsequent discussion o this study includes section two; review of literature, section three; methodology, section four; presentation, analysis and interpretation of results while the last section concludes and make recommendations.

The research finding is expected to benefit various groups of individuals, corporate entities, regulatory agencies (FMFBNP, CBN, BOF, DMO and NBS) amongst others as well as the three tiers of government (Federal, States and Local Government areas). Specifically, the empirical findings of the study will serve as a clarion call and the desire for the Federal Ministry of Finance to implement a proactive fiscal strategies, programmes and policies tailored at cushioning the adverse impact of budget deficit on financial sustainability. This can be attained through effective liaison with the Budget Office of the Federation (BOF) for a more robust, reliable and hitch-free fiscal stability in Nigeria.

2. Literature Review

This section illustrate in diagrammatical format, the component of both the explanatory variables and the explained (Outcome) variable of the study. The component of the explanatory variables is public budget deficit financing and macroeconomic attributes which were proxied by five (5) major explanatory variables; External debt (EXTD), External reserve (EXRS), Debt servicing (DBS), Exchange rate (EXR) and Inflation rate (CPI). Therefore, the concept of Financial Sustainability (FINS) was used as the explained (outcome) variable of the study. The hypothetical illustration of the conceptual framework can be depicted under figure 1 as follows:

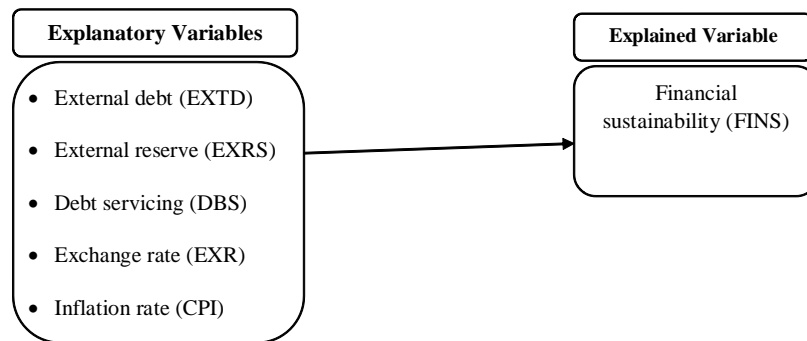**Explanatory Variables**

- External debt (EXTD)
- External reserve (EXRS)
- Debt servicing (DBS)
- Exchange rate (EXR)
- Inflation rate (CPI)

Explained Variable

Financial sustainability (FINS)

Figure 1: Hypothetical Conceptualization of Variables

2.1. Financial Sustainability

Conceptually, the financial stability of a country portrays its capacity to cater for total public debt commitment in the short-term. This is contrary to fiscal sustainability which considers debt commitment in the long-term (Onyele *et al.,* 2023). Specifically, financial sustainability can be perceived as a condition in which the government is able to accomplish a financial stance that enables it to service public debt in the medium and long term (Ali, 2022; Yusri *et al.,* 2019). This is regardless of default or rescheduling, devoid of the need to embark on policy adjustment that are incredible from a political or economic point of view based on the financing expenses and circumstances it encounters. Hence, financial sustainability signifies government's capacity to ensure liquidity, maintain current expenditure, and tax policy while projected spending or long-term financial commitments are not destabilized (Osazefua, 2019).

2.2. Macroeconomic Attributes

From the perspective of macroeconomic policies, it deals with the study of the aggregate economy at the larger national level. This is further broken down into fiscal policy, monetary policy and trade policy (Kolapo, 2010). The term fiscal policies deal with the revenue and expenditure strategies of government at a given period of time usually a year (Ken, 2020). Fiscal policies therefore, are the use of government revenue and expenditure (Budget Estimates) to control the economy at a given period of time. It can also be defined as a macro-economic instrument which is used by the government to regulate the economy (Kolapo, 2010). The term fiscal policies can be classified into two viz; expansionary fiscal policy and Contractionary fiscal policy.

2.3. Budget Deficit Financing

Budget deficit can be defined as the amount by which expenditures outweighs revenue in a particular period of time (Oluwole *et al.,* 2020). Keynes argues that expansionary fiscal policy should be used in period of economic recession or low economic activity as an essential instrument for building the framework for robust economic growth and working towards full employment (Keynes, 1934). When government runs a deficit budget, funds will need to come from government borrowing (the issue of government bonds), overseas borrowing, or monetizing the debt (Anthony & Jude, 2021; Ken, 2020). This decision could have the tendency of decreasing aggregate demand for goods and services either partially or generally thereby, preventing the direct expansionary impact of the deficit expenditure (Erwin, 2020). Specifically, the definition of budget deficit as

documented by Erwin (2020) and Ken (2020) will be suitably adopted for the purpose of this study.

It is usually undertaken by the government when trying to balance the contraction phase in the business cycle. It involves government spending exceeding tax revenue by more than it has intended to, and is usually undertaken during recessions (Ken, 2020). Thus, it is the excess of government expenditure over its estimated revenue for a given period of time usually a year (Anthony & Jude, 2021).

2.4. Review of Empirical Literatures

2.4.1. External Debt and Financial Sustainability

One of the most recent studies was the research work of Alagoa *et al.* (2023) who investigated the connection flanked by debt obligation and economic development in Nigeria within the durations of 1981 to 2020. The study covered the duration of 1981 to 2020 where Autoregressive Distributed Lag (ARDL) model was tested. It was discovered that external debt stock contributed significantly and inversely to economic development in Nigeria. However, debt to GDP ratio as the most powerful measure of economic development and sustainability has not been captured and used in the study. Hence, different and more reliable empirical results could have been documented.

In the work of Uchechi *et al.* (2022), they studied the effect of foreign debt stability on Nigerian economic development from 1980-2015. The data for this study was obtained from the secondary sources through the Central Bank of Nigeria's bulletin of several publications and world development indicators. The results showed that foreign borrowing is positively correlated with general productivity. Nonetheless, the study fails to consider the aspect of financial sustainability while prioritizing on economic growth. Thus, economic growth as measured by GDP is not as powerful as debt-to-GDP ratio when financial sustainability is used the outcome variable. Hence, different empirical evidence could have been established.

Ali (2022) studied the nexus flanked by exchange rate fluctuation, financial stability, foreign borrowings, and economic development in a few South Asian countries from 1985 to 2020. The findings indicate that external debt has a negative and insignificant effect on the extent of economic growth in South-Asian countries. Nonetheless, the study was conducted in South-Asian countries where variations in economic systems, legal and regulatory frameworks become obvious among the selected countries. This result may not be obtainable if conducted in the African continent using Nigeria as evidence.

2.4.2 External Reserve and Financial Sustainability

Akanbi *et al.* (2022) examined the relationship between foreign borrowing servicing and economic development in Nigeria from 1981 to 2020. The ARDL bound test results showed that there was long-run co-integration. The study revealed that there is a positive but insignificant correlation between foreign reserves and economic growth in Nigeria. Nevertheless, some advanced estimation techniques like Generalized Autoregressive Conditional Heteroskedasticity (GARCH) amongst others has not been captured in the study and hence, unique and more reliable findings could have been documented.

Chinemerem *et al.* (2022) investigated the influence of deficit budget on sectorial productivity in Nigeria. Hence, the two models support the ARDL methodology as they revealed mixed integration. The study discovered that foreign reserve has a positive significant effect on industrial output in Nigeria. Moreso, foreign reserve has a significant effect on the services industry productivity in Nigeria. Indeed, the study exposed that budget deficit and external reserve indicated a positive significant effect on manufacturing industry output. On the contrary, it indicated a negative insignificant impact on services industry output. Unfortunately, industrial output was employed as a proxy for financial sustainability which may not provide adequate measure for financial sustainability at large.

In another empirical study, Mussa (2022) analyzed the influence of budget deficit on inflationary level in Tanzania. The study shows that the effects of budget deficit on inflation level rely significantly on its funding alternatives. The findings indicate that foreign reserve is counter-inflationary. In addition, the study reveals that budget deficit funded by falling back on surplus foreign reserves will eradicate inflation. However, the study has employed general price level (inflation rate) as a proxy economic growth and/or national development by extension. This could not provide or reflect the true picture of national development as there are other key macroeconomic variables that were neglected. Hence, the findings cannot be generalized to other emerging economies like Nigeria.

2.4.3. Debt Service and Financial Sustainability

Alagoa *et al.* (2023) investigated the nexus linking debt obligation and economic development in Nigeria. The study covered the duration of 1981 to 2020 where Autoregressive Distributed Lag (ARDL) model was tested. It was discovered that foreign debt service has no significant impact on economic growth in Nigeria. Unfortunately, debt to GDP ratio as the most powerful measure of economic

growth and sustainability has not been captured and employed in the study. Hence, unique and more reliable empirical results could have been documented.

Uchechi *et al.* (2022) studied the effect of foreign debt sustainability on Nigerian economic development. The data for this study was obtained from the secondary sources through the Central Bank of Nigeria's bulletin of several publications and world development indicators. The data were revealed to be stationery at their first level. The results were also revealed to be co-integrated. The results showed that debt service is negatively but significantly correlated with GDP. Nonetheless, the study fails to consider the aspect of financial sustainability while prioritizing on economic growth. Thus, economic development as measured by GDP is not as powerful as debt-to-GDP ratio when financial sustainability is used the outcome variable. Hence, different empirical evidence could have been established.

Similarly, Mathew and Adetayo (2022) examined the effect of debt sustainability on Nigeria's economic growth. With respect to debt service commitments, the short-term influence indicated that economic growth declines when debt service rises and economic growth rises when debt service commitment falls down. Regardless of the recency in the study, the effect of domestic debt and other macroeconomic variables like external reserves were neglected in the study. Hence, different empirical evidence could have been established.

2.4.4. Exchange rate and Financial Sustainability

Raifu and Farayibi (2022) examined the impact of exchange rate volatility on various indicators of financial development. The findings generally reveal that the method of obtaining exchange rate volatility influences its impact on financial development in Nigeria and South Africa. Although, the study employed financial sector development as the outcome variable in two countries; Nigeria and South-Africa. Meanwhile, financial sector development is just a subset of financial sustainability that considers the entire sectors of the economy. Hence, unique empirical evidence could have been documented.

Ali (2022) examined the connection between exchange rate volatility and economic growth in selected South Asian countries from 1985 to 2020. The findings indicate that exchange rate volatility has a positive and significant correlation with economic growth. The overall results conclude that exchange rate volatility is contributing significant impetus in influencing economic growth in the context of selected South Asian countries. Nonetheless, the study was conducted in South-Asian countries where variations in economic systems, legal and regulatory

frameworks become obvious among the selected countries. This result may not be obtainable if conducted in the African continent using Nigeria as evidence.

Kolawole (2021) in his work examined the association between financial stability and macroeconomic attributes in Nigeria using time series data capturing the period 1981-2019. The findings from the ARDL indicated that exchange rate as proxied by consumer price index has positive significant effect on financial sustainability in Nigeria. On the contrary, the short-run analysis establishes negative and insignificant influence of exchange rate on financial sustainability in Nigeria. Nevertheless, the study is not without some methodological loopholes as bound test, ARDL and Vector Error Correction Model (VECM) has not been captured as the techniques for data analysis.

Olusegun *et al.* (2021) examined debt service and its influence on economic growth in Nigeria. The secondary data were collected from the debt management office which covered the duration of thirty (30) years ranging from 1990-2020. The results showed that there was presence of co-integration (long-run correlation) among the outcome and all the explanatory variables which indicated that exchange rate has a negative significant correlation with economic growth in Nigeria. However, more advanced estimation techniques like Autoregressive Conditional Heteroskedasticity (ARCH) and Generalized Autoregressive Conditional Heteroskedasticity (GARCH) were neglected in the aforementioned study. Hence, more reliable results could have been established.

Ajisafe, Odejide and Ajide (2021) investigated the dynamic effects of monetary policy on financial stability in Nigeria between 1986 and 2017. The findings revealed that exchange rate was a dominant predictor of financial stability in Nigeria. However, the result cannot be generalized to suit current realities due period flaws. Specifically, the data used in the study stopped at 2017 thereby neglecting 2018, 2019, 2020, 2021 and more recently 2022; i.e. a period of about five (5) years.

2.4.5. Consumer Price Index Rate and Financial Sustainability

Chinemerem *et al.* (2022) examined the effect of deficit financing on Sectorial Output in Nigeria from 1986–2020. The study found that consumer price index has a negative and insignificant impact on manufacturing sector productivity. Though, it has a significant effect on the services industry productivity in Nigeria. Indeed, the study exposed that budget deficit revealed a positive significant effect on manufacturing industry output. Unfortunately, industrial output was employed as a proxy for GDP which may not provide adequate measure for financial sustainability at large.

Similarly, Terhemba *et al.* (2022) conducted an empirical study titled reconsidering the nexus between monetary policy and economic growth in Nigeria. The study was carried out for a period of seventeen (17) years ranging from 2004 to 2020 which was a projection of thirty (30) quarters period. The findings revealed that inflation rate proxied by consumer price index is statistically and significantly related with economic growth in the short-run. Whereas, it has statistical significant effects on economic growth in Nigeria in the long run. Nevertheless, the concept of economic growth is not clearly defined as it deals with both price stability, full employment, Gross Domestic Product (GDP) among other macroeconomic variables. Thus, different empirical findings could have been established.

In their empirical study, Oyatayo and Ivongbe (2021) investigated thẳ effect ỉf deficit financing în Nigằriàn ẳñînîmiñ growth from 1988-2018. The finding shows that the explanatory variable has significant effect on economic growth in Nigeria. Nonetheless, there is contradiction regarding the use of Real Gross Domestic Product (RGDP) as a predictor (explanatory) variable and also as a criterion (dependent) variable of the study. This has rendered the empirical findings of the study ambiguous, confusing and even unrealistic.

Kolawole (2021) in his work examined the association between financial stability and macroeconomic attributes in Nigeria using time series data capturing the period 1981-2019. The findings revealed that inflation rate as proxied by consumer price index has positive significant effect on financial sustainability in Nigeria. On the contrary, the short-run analysis establishes negative impact of consumer price index on financial sustainability in Nigeria. Ajisafe *et al.* (2021) investigated the dynamic effects of monetary policy on financial stability in Nigeria between 1986 and 2017. The findings revealed that consumer price index was found to have strong positive and significant impact on financial stability in Nigeria. However, the result cannot be generalized to suit current realities due period flaws. Specifically, the data used in the study stopped at 2017 thereby neglecting 2018, 2019, 2020, 2021 and more recently 2022; i.e. a period of about five (5) years.

Theoretical Framework

Fiscal Illusion Theory

The theory of fiscal illusion emanates from the contribution made by Buchanan (1967). Fiscal illusion is concerned with the misconception of fiscal instruments. As contended by Oates (1985), fiscal illusion advocates increasing opinions and

prejudices relating to government budgetary strategies in every dimension in line with deficient information. Afonso (2014) contends that the goals of public policies seem to be isolated and unrecognized by the people, while the people mainly bear the direct effect of sources of funding the budget, such as tax revenues. In sum, the fiscal illusion theory seeks to describe the level as well as how the instability in fiscal policies and instruments affect the socio-economic and financial fortunes of a given economy.

Debt Overhang Theory

The debt overhang theory advocates that if an economy is extremely obliged to the stage that the borrowed funds is greater than its repayment status, debt servicing will strangle investments and hinder economic growth (Otonne & Oyenuga, 2019) . Debt overhang is a condition or situation where the debt outstanding is extremely high to the level that an economy could not acquire future debt funds to finance fresh activities. Okodua et al. (2022) contended that the theory advocates that government borrows and government debt financing influence economic development by making debt commitment the apex relative to any spending. Extreme government deficit financing has a double-impact on the local economy. The first is crowding out impact and indeed, appreciation in interest rate.

On the overall, it has been observed from the review of the various concepts that there are conflicting opinions, views and arguments in respect of the conceptual reviews of the study. From the perspective of extant literatures, it was observed that findings have been unrealistic, conflicting, inconclusive or grossly inadequate. Most importantly, empirical evidence have not yet been tested most especially the one that captures and combines external debt, external reserve, debt service, exchange rate and consumer price index (all as predictors) of financial sustainability proxied by GDP and measured as the Debt to GDP ratio was used as the criterion or outcome variable of the study. Theoretically, fiscal illusion theory was used as the major underpinning theory of the study while debt overhang theory was employed to anchor the variables as the supporting theory of the study.

3.   Methodology and Model Specification

This study adopted Expost-facto in order to collect detailed and factual historical information that describes an existing phenomenon. Specifically, the choice of the philosophy was based on the notion that it seeks to examine existing knowledge which is presumed to be "Objectively Attained" concerning a

Table 1: Variables Measurement and Definitions

S	Variable Name	Acronym	Variable Type	Proxy/Measurement	Source(s)
1.	Financial Sustainability	FINS	Explained	Proxied by Gross Domestic Product (GDP) and measured as the debt to GDP ratio during the period.	Anthony & Jude, 2021; Kumar *et al.* (2019).
2.	External Debt	EXTD	Predictor	Measured as the total annual borrowings from abroad during the period.	(Abubakar, 2022; Terhemba *et al.*, 2022).
3.	External Reserve	EXRS	Predictor	Measured as the annual amount standing in the country's external reserve.	(Erwin, 2020; Kelvin & Ibim, 2020).
4.	Debt Servicing	DBS	Predictor	Measured as the amount of debt repayment during the period of the study.	(World Bank, 2022; Ekundayo *et al.*, 2021; Mahbub *et al.*, 2020; Eregha & Mesagan, 2019; Russo, 2009).
5.	Exchange Rate	EXR	Predictor	Measured as the average exchange rate between the local currency (₦) and US ($) during the study period.	Ekundayo *et al.* (2021), World Development Indicators (2018).
6.	Consumer Price Index	CPI	Predictor	Measured as the average inflation rate proxied by CPI during the period of the study.	Kelvin and Ibim (2020).

Source: Compiled by the Authors (2023), Based on Literature.

particular phenomenon while the quantitative approach was selected as it deals with the collection of time-series numerical data.

This study used Nigerian economy as the population of the study with emphasis on the macroeconomic data. A sample of fourty (40) years [1983 – 2022] both inclusive was employed and used for data collection and hence, convenience sampling technique was used in the process of data collection for the study. The study employed the use of time series secondary data which was obtained from the Central Bank (CBN), the Budget Office and the National Bureau of Statistics between the study periods (1982 to 2022); a period of fourty (40) years. This is based on the series of socio-economic and political events that have taken place during the period which directly or indirectly affect the level of macroeconomic activities of the country and the overall economy at large.

The study employed data treatment techniques such as the unit root test by using the Augmented Dickey-Fuller and Phillips Perron (ADF-PP) model among other techniques. Again, the bounds test, the ARDL estimation techniques were also used in this study. This is based on the notion that the hypothesized financial sustainability and the public budget deficit financing, macroeconomic attributes that are connected to it were expressed through the ARDL estimation model.

In this section, the model was also specified and adapted in line with the extant literatures. The hypothesized financial sustainability and the public budget deficit financing, macroeconomic attributes that is connected to it was depicted by econometric regression model as follows:

$$FINS_t = \delta 0 + \delta 1 EXTD_t + \delta 2 EXRS_t + \delta 3 DBS_t + \delta 4 EXR_t + \delta 5 CPI_t + \mu_t \quad (i)$$

Where; $FINS_t$ = Financial Sustainability during the period; $\delta 0$ = Intercept or constant term; $EXTD_t$ = External debt during the period; $EXRS_t$ = External Reserve during the period; DBS_t = Debt Servicing (repayment) during the period of the study; EXR_t = Exchange rate; CPI_t = Consumer Price Index during the period; μ_t = stochastic white noise error term with zero mean and constant variance; $\delta 1 – \delta 5$ = Beta coefficient of the explanatory variables;

4. Results and Discussion

Unit Root Test

The test is used to determine the order of integration of a variable (Independent variables with the dependent variable); i.e. how many times it has to be differenced or not to become stationary.

Table 1: Unit Root Test for Stationarity

Variables	Order of Integration	Augmented Dickey Fuller (ADF)Test			ADF	P – Values
		1%	*5%*	*10%*		
GDP	I(1)	***	-	-	-5.0562	0.0002
EXTD	I(1)	***	-	-	-4.7316	0.0005
EXRS	I(1)	***	-	-	-4.8373	0.0004
DBS	I(1)	***	-	-	-5.9583	0.0000
EXR	I(1)	***	-	-	-4.0886	0.0029
DBS	I(0)	-	**	-	-3.3458	0.0198
CPI	I(0)	no	no	no	0.2611	0.9728

Source: E-views Output Result (2023)

From table 1, it shows that all the variables except LDBS were stationary at first difference. This signifies that only LDBS was stationary at level with a corresponding 5% level of significance. Indeed, CPI which represents the inflationary rate during the period was only stationary at level. By implication, GDP, EXTD, DMBT, DBS and EXR were jointly found to have an integrated order of I(1). Hence, the variables were exclusively stationary at first difference with 1% level of significance. It could also be seen that all the variables were stationary at all levels of significance except for CPI which is stationery at level i.e. I(0) exclusively. This also implies that CPI has no stationarity at first difference.

EC = LGDP - (0.1638*LEXTD + 0.1441*LEXRS + 0.1001*LDBS + 0.0044*EXR + 0.0039*CPI + 26.2312)

Table 2: Bound Test Result

T-Statistics	Value	Sig.	Lag	I(0)	I(1)
F - Statistics	15.198315	10%	2	2.08	3
		5%		2.39	3.38
		2.5%		2.7	3.73
		1%		3.06	4.15

Source: E – views Output Result (2023).

From table 2, it shows the F-statistics value of 15.198315 with the corresponding lower and upper bounds values of 2.39 and 3.38 respectively. This signifies that the F-statistics value of 15.19835 is greater than the upper bound value of 3.38 at 5% level of significance. Indeed, F-statistics value of 15.198315 is also greater than the upper bounds values at all other levels of significance 10%, 2.5% and 1% with corresponding critical values of 3.0, 3.73 and 4.15 respectively. By implication, it reveals a strong co-integrating association between the

explanatory variables; (EXTD, EXRS, DBS, EXR and CPI) and the explained variable; GDP. Hence, it provides the basis for rejecting the null hypothesis which states that there is no co-integrating relationship between the variables. Therefore, it validates the notion that there is strong co-integrating association linking the variables of the study. Sequel to the aforementioned result depicted by bounds test, the estimated ARDL model for long-run co-integration is depicted in table 3 as follows:

Table 3: Estimated Long-Run (ARDL) Co-integration Result

Regressors	Beta Coefficients	T - Values	P – Values
Constant	6.608803	2.525966	0.0225
EXTD	0.041269	0.864054	0.4003
EXRS	0.03042	1.816914	0.0880
DBS	-0.003632	-0.304643	0.0893
EXR	0.001399	3.224925	0.0053
CPI	0.010302	2.763687	0.0138

Source: E-views Output Result (2023).

External Debt and Financial Sustainability

Based on the result in table 3, it shows the long-run beta coefficient value of external debt as 0.041269 with corresponding t-value and p-value of 0.864054 and 0.4003 respectively. This signifies that external debt has positive but insignificant impact on financial sustainability in Nigeria in the long-run. This implies that a proportional increase in the amount of external debt by ₦0.0412 billion leads to an increase in financial sustainability as measured by Debt-GDP to the tune of ₦0.8641 billion in the long-run. Interestingly, this result is consistent with the findings documented by Alagoa *et al.* (2023) and Uchechi *et al.* (2022). Nevertheless, it is contrary to the result established by Ali (2022). Again, the result is in consonance with the null hypotheses one H_{01} of the study which state that external debt has no significant impact on financial sustainability in Nigeria. Thus, for hypothesis one, H_{01} is failed to be rejected.

External reserve and Financial Sustainability

Similarly, the result in respect of external reserve shows a long-run coefficient value of 0.03042 with a corresponding t and p values of 1.816914 and 0.0880 respectively. This signifies the fact that external reserve has statistical positive and significant effect on financial sustainability as measured by GDP in the long-run. By implication, an increase in external reserve by ₦0.0310 billion leads to an increase in financial sustainability as measured by GDP to the tune of ₦1.8169

billion in the long-run. This is not surprising at all, as a country with favorable balance in its external reserve is more likely to have sustainable financial status which is an indication for consistent and sound growth in GDP in the long-run. Conversely, a country with declining external reserve is more likely to be battling with excessive deficit financing, declining productivity growth and ultimately, financial predicaments amongst other macroeconomic issues. The finding is in line with the work of Akanbi *et al.* (2022) but contradicted the work of Chinemerem *et al.* (2022) and Mussa (2022). The result is also contrary to the hypothesis two of the study which state that external reserve has no significant effect on financial sustainability in Nigeria. Thus, for hypothesis two, H_{02} is rejected.

Debt Service and Financial Sustainability

From the perspective of debt servicing, the long-run coefficient was found to be -0.0036 with a corresponding t and p values of -0.304643 and 0.0893 respectively. This signifies that debt servicing is statistically, negatively but significantly influencing the financial sustainability through GDP in the long-run. This implies that a proportional decrease in debt servicing is tantamount to decrease in financial sustainability as measured by GDP in the long-run. Interestingly, the aforementioned result is no longer a strange issue as a failure in debt service is an indication of loan default. A default in debt service could translate into poor debt-revenue ratio and this could serve as a signal for poor "Internally Generated Revenue" (IGR) relative to the amount for debt servicing. This was a practical scenario in the Nigerian context in the first quarter (Q1) of 2022 financial year. Therefore, debt servicing has negative but significant influence on financial sustainability (GDP) in the long-run. This result is consistent with the findings documented by Uchechi *et al.* (2022) as well as Mathew and Adetayo (2022). However, the result contradicted the work of Alagoa *et al.* (2023) as well as the work of Onyele and Nwadike (2021) who jointly established a statistical positive and significant influence of debt service on financial sustainability in Nigeria. Moreso, the result is contrary to the hypothesis three (H_{03}) of the study which state that debt service has no significant influence on financial sustainability in Nigeria. Thus, for hypothesis three, H_{03} is rejected.

Exchange Rate and Financial Sustainability

Furthermore, the result in respect of exchange rate shows a long-run coefficient value of 0.001399 with corresponding t and p values of 3.224925 and 0.0053 respectively. This signifies that exchange rate is statistically, positively and

significantly co-integrated with financial sustainability proxied by GDP in the long-run. By implication, a proportional increase in exchange rate lead to a proportional increase in financial sustainability in the long-run. This buttresses the fact that the higher the value of naira exchange rate relative to the foreign currencies like US Dollar ($), Pound Sterling (£), Japanese Yan (¥) amongst others, the higher the level of financial sustainability measured in terms of GDP in the long-run. Thus, exchange rate has a positive and significant co-integrating impact on financial sustainability in the long-run. This is confirmed by the p-value which is significant at 5% level of significance.

Consumer Price index and Financial Sustainability

Moreso, the result in respect of inflation rate as proxied by consumer price index (CPI) reveals a long-run coefficient value of 0.010302 with a corresponding t and p values of 2.763687 and 0.0138 respectively. This signifies that inflation rate proxied by (CPI) has a statistical positive and significant co-integration with financial sustainability in the long-run. By implication, a proportional increase in inflation rate as measured by CPI brings about an increase in gross domestic product (GDP). This will ultimately reflect on financial sustainability in the long-run.

Table 4: The Estimated Short-Run Co-integration Test

Regressors	Beta Coefficients	T - Values	P – Values
Constant	-0.251945	-12.09478	0.0000
EXTD	0.163802	0.808878	0.4304
EXRS	-0.017429	-2.08437	0.0606
DBS	-0.017407	-2.467390	0.0253
EXR	-0.001399	-4.898339	0.0002
CPI	-0.010302	-5.526254	0.0000
R - Squared		0.7877	
Adjusted R^2		0.6719	
Durbin Watson		2.3310	
Mean Dependent		0.0426	
S. D. Dependent		0.0364	

Source: E-views Output Result (2023).

Based on the result in table 4, the adjusted R^2 shows a value of 0.6719 which signifies that the coefficient of determination (R^2) explains approximately 67.19% of the total level of co-integration and changes in financial sustainability as measured by GDP in the short-run. It implies that the regressors given by EXTD, EXRS, DBS, EXR and CPI jointly explained 67.19% of the total degree of co-

integration with the financial sustainability proxied by Gross Domestic Product (GDP). Hence, only 32.81% of the total co-integration was explained by other parameters not captured in the econometric model of the study. Therefore, there is strong statistical co-integration between the regressors and the criterion variable of the study. Most importantly, the Durbin Watson statistics reveal a value of 2.3310. This signifies that the model is in tandem with the rule of thumb of "2" for a model fitness test. By implication, the model of the study is good, adequate and well-fitted and that the regressors are properly selected, combined and used.

External Debt and Financial Sustainability

Accordingly, the result in table 4 shows the short-run beta coefficient value of external debt as 0.163802 with corresponding t-value and p-value of 0.808878 and 0.4304 respectively. This signifies that external debt has positive but insignificant co-integrating impact on financial sustainability in Nigeria in the short-run. This implies that a proportional increase in the amount of external debt by ₦0.16380 billion leads to an increase in financial sustainability as measured by GDP to the tune of ₦0.808878 billion in the short-run. The finding is consistent with the work of Ali (2022) but unfortunately contradicted the findings documented by Uchechi *et al.* (2022), and Alagoa *et al.* (2023). Moreso, the result provided empirical proof for not rejecting hypothesis one (H_{01}) of the study which state that external debt has no significant impact on financial sustainability in Nigeria. Thus, for hypothesis one, H_{01} failed to be rejected.

External Reserve and Financial Sustainability

Similarly, the result in respect of external reserve shows a short-run coefficient value of -0.017429 with a corresponding t and p values of -2.018437 and 0.0606 respectively. This signifies the fact that external reserve has statistical positive and significant effect on financial sustainability as measured by GDP in the short-run. By implication, a decrease in external reserve by – ₦0.017429 billion leads to a decrease in financial sustainability as measured by GDP to the tune of – ₦2.018437 billion in the short-run. This is not surprising at all, as a country with favorable balance in its external reserve is more likely to have sustainable financial status which is an indication for consistent and sound growth in GDP in the short-run. Conversely, a country with declining external reserve is more likely to be battling with excessive deficit financing, declining productivity growth and ultimately, financial predicaments amongst other macroeconomic issues. Interestingly, the result is in tandem with work of Chinemerem *et al.* (2022),

Mussa (2022) but contradicted the work of Akanbi *et al.* (2022). Thus, it provides the evidence for rejecting hypothesis two (H_{02}) of the study which state that external reserve has no significant effect on financial sustainability in Nigeria. Thus, for hypothesis two, H_{02} is rejected.

Debt service and Financial Sustainability

From the perspective of debt servicing, the short-run coefficient was found to be -0.0117407 with a corresponding t and p values of -2.467390 and 0.0253 respectively. This signifies that debt servicing is statistically, negatively but significantly influencing the financial sustainability measured by GDP in the short-run at 5% level of significance. This implies that a proportional decrease in debt servicing is tantamount to decrease in financial sustainability as measured by GDP in the short-run. Interestingly, the aforementioned result is no longer a surprising issue as a decline in debt service is an indication of loan default. A default in debt service could translate into poor debt-revenue ratio and this could serve as a signal for poor "Internally Generated Revenue" (IGR) relative to the amount for debt servicing. This was a practical scenario in the Nigerian context in the first quarter (Q1) of 2022 financial year. Therefore, debt servicing has negative but significant influence on financial sustainability (GDP) in the short-run. Thus, the speed of change or adjustment is very low. The finding is in tandem with the work of Uchechi *et al.* (2022) and Mussa (2022). However, it contradicted the work of Alagoa *et al.* (2023), Mathew and Adetayo (2022) as well as the work of Onyele and Nwadike (2022). Similarly, it also provides the basis for rejecting hypothesis three (H_{03}) of the study which state that debt service has no significant influence on financial sustainability in Nigeria. Therefore, for hypothesis three, H_{03} is rejected in the study.

Exchange Rate and Financial Sustainability

Furthermore, the result in respect of exchange rate shows a short-run coefficient value of -0.001399 with corresponding t and p values of -4.898339 and 0.0002 respectively. This signifies that exchange rate is statistically, positively and significantly co-integrated with financial sustainability proxied by GDP in the short-run. By implication, a proportional increase in exchange rate lead to a drastic increase in financial sustainability in the short-run. This buttresses the fact that the declining value of naira exchange rate relative to the foreign currencies like US Dollar ($), Pound Sterling (£), Japanese Yan (¥) amongst others, might bring about diminishing level of financial sustainability measured in terms of GDP in the short-run. Thus, exchange rate has a negative and significant co-

integrating impact on financial sustainability in the short-run. This is confirmed by the p-value which is significant at 1% level of significance.

Consumer Price Index and Financial Sustainability

By and large, the result in respect of inflation rate as proxied by consumer price index (CPI) reveals a short-run coefficient value of 0.010302 with a corresponding t and p values of 2.763687 and 0.0138 respectively. This signifies that inflation rate proxied by (CPI) has a statistical positive and significant co-integration with financial sustainability in the short-run. By implication, a proportional increase in inflation rate as measured by CPI could bring about an increase in gross domestic product (GDP) as a proxy for financial sustainability. This will ultimately reflect on financial sustainability in the short-run. Hence it further indicates a very low speed of adjustment between the CPI and financial sustainability in the short-run.

Table 5: Vector Autoregressive Residual Diagnostic Test Results

Diagnostics		Test Statistics	Probability
Serial Correlation	Lag1	0.294740	0.7492
LM Test	Lag2	1.414157	0.4931
Heteroskedacity Chi-Sq.		22.24302	0.2214
Normality [Jaque Bera]		2.627304	0.268837

Source: E-views Output Results (2023).

Based on the result depicted in table 5, it shows that t-values with the corresponding p-values of 0.294740 and 0.7492 in the lag1 and 1.414157 with 0.4931 in the lag 2 respectively. This signifies that there is absence of serial correlation among the variables of the study. It also implies that serial correlation may not pose a strong threat to the variables of the study both in the first and second lags of the study. In respect of the Hettest, it shows a chi^2 value of 22.24302 with a corresponding p-value of 0.2214. This signifies that the residuals in the model of the study are homoscedasticity. By implication, there is no Heteroskedasticity issues associated with the residuals in the model of the study. Finally and most importantly, the results in respect of the Jaque Bera test for normality of a data shows a t-statistic value of 2.627304 with a corresponding p-value of 0.268837. This signifies that the residuals in the model are statistically insignificant. It implies that the residuals in the model of the study are normally distributed. However, the normality or otherwise of a data does not in any way affect the inferential result of the study (Shao, 2003).

Discussion of Findings

From table 1, it indicates that all the variables excluding the DBS were stationary at first difference. This signifies that only DBS was stationary at level with a corresponding 5% level of significance.

Based on the information in table 2, it shows the F-statistics value of 15.198315 with the corresponding lower and upper bounds values of 2.39 and 3.38 respectively. This signifies that the F-statistics value of 15.19835 is greater than the upper bound value of 3.38 at 5% level of significance. Indeed, F-statistics value of 15.198315 is also greater than the upper bounds values at all other levels of significance 10%, 2.5% and 1% with corresponding critical values of 3.0, 3.73 and 4.15 respectively. By implication, it reveals a strong co-integrating association between the explanatory variables; (EXTD, EXRS, DBS, EXR and CPI) and the explained variable; GDP. Hence, it provides the basis for rejecting the null hypothesis which states that there is no co-integrating relationship between the variables.

Based on the result of ARDL for long-run co-integration, it clearly states that all the regressors (EXTD, EXRS, DBS, EXR and CPI) have a long-run co-integration with the outcome variable of the study (financial sustainability) as measured by GDP. In the other spectrum and with reference to the result in table 4, the adjusted R^2 shows a value of 0.6719 which signifies that the coefficient of determination (R^2) explains approximately 67.19% of the total level of co-integration and changes in financial sustainability as measured by GDP in the short-run. It implies that the regressors given by EXTD, EXRS, DBS, EXR and CPI jointly explained 67.19% of the total degree of co-integration with the financial sustainability proxied by Gross Domestic Product (GDP).

Based on the result depicted in table 5, it shows that t-values with the corresponding p-values of 0.294740 and 0.7492 in the lag1 and 1.414157 with 0.4931 in the lag2 respectively. This signifies that there is absence of serial correlation among the variables of the study. It also implies that serial correlation may not pose a strong threat to the variables of the study both in the first and second lags of the study. In respect of the Hettest, it shows a chi^2 value of 22.24302 with a corresponding p-value of 0.2214. This signifies that the residuals in the model of the study are homoscedasticity. By implication, there is no Heteroskedasticity issues associated with the residuals in the model of the study. Finally and most importantly, the results in respect of the Jaque Bera test for normality of a data shows a t-statistic value of 2.627304 with a corresponding p-value of 0.268837. This signifies that the residuals in the model are statistically insignificant. It implies that the residuals in the model of the study are normally distributed.

5.   Conclusion and Recommendations

With reference to the aforementioned findings of the study, the following conclusion are drawn:

(i)   Based on the result of ARDL for long-run co-integration, it is concluded that that all the regressors (EXTD, EXRS, DBS, EXR and CPI) have a long-term co-integration with the financial sustainability as measured by GDP;

(ii)   It is also concluded that there is a short-term co-integration between the regressors given by (EXTD, EXRS, DBS, EXR, CPI) and financial sustainability in Nigeria. Indeed, the regressors have jointly explained 67.19% of the total degree of co-integration with the financial sustainability;

(iii)   It is also concluded that the residuals in the model are statistically insignificant and that there is stability in the model of the study.

In line with the conclusion, the following recommendations have been advanced:

(i)   The Federal Government of Nigeria through the apex bank (CBN) should deploy a holistic approach designed at tackling the continual increase in the inflationary level. This can be effectively achieved by means of reducing the too much quantum of money supply (circulation) through efficient introduction of cash-less policy, e-Naira and price-control mechanisms amongst others;

(ii)   Government borrowings through external debt and debt servicing arrangements should be tailored to tackle critical and physical infrastructures. This should includes the revitalization of abandoned companies, sectors or industries with a view to tap and maximize their revenue potentials to the greatest possible extent and hence, reflecting on the financial sustainability of Nigeria as a developing economy;

(iii)   The FGN through the Federal Ministry of Finance should collaborate with all relevant stakeholders aimed at minimizing the adverse effect of external debt, debt servicing, external reserve, exchange rate and CPI on the domestic economy. This can be successfully accomplished by deploying rigorous debt management strategies such as debt re-scheduling, debt conversion, debt repudiation, debt for equity and debt for cash strategies amongst others. If effectively articulated and monitored, the adverse effect of foreign debt on the domestic economy could be drastically reduced if not completely eradicated;

(iv) The Debt Management Office (DMO) should within their constitutional powers, deploy effective and flexible debt management strategies while collaborating with key participants towards export promotion, import substitution amongst others. This is envisaged at reducing the adverse effect and further accumulation of debt stock on the financial sustainability of Nigeria;

(v) The FMFBNP should consistently embark on revenue diversification projects. This can be effectively achieved through increasing the number of tax payers (i.e. tax base) instead of the tax rate (%) that negatively shifted the burden on the purchasing power parity (PPP) of the final consumers. The Small and Medium Scale Enterprises (SMEs) are good avenues by which the Federal Government of Nigeria can mobilize the needed financial resources through the extension of revenue collection and assessment to some of these SMEs across the country.

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