POLAC MANAGEMENT REVIEW (PMR)
DEPARTMENT OF ECONOMICS AND MANAGEMENT SCIENCE
NIGERIA POLICE ACADEMY, KANO

DEBT MANAGEMENT STRATEGIES AND PUBLIC DEBT SUSTAINABILITY IN NIGERIA: ROLE OF BOND MARKET DEVELOPMENT

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Abstract

*To examine the impact of debt management strategies on the Nigeria public debt sustainability, the study controlled for institutional quality. The study used secondary time series that for the period 1990-2020. The study applied the autoregressive distributed lagged model econometric methodology in order to investigate the long-run and the short run dynamics reaction of total debt/GDP of the country to Debt Relief (DEBTRL), Debt Forgiveness (DEBTFG), Debt Conversion (DEBTCV) and B*ond Market Development index (BMD). *The study found that DEBTRL and DEBTFG have negative and BMD has positive impact on total debt profile in Nigeria, while DEBTCV had no significant effect on the Nigeria's debt profile, and INSQ has positive significant effect. Thus, the study concluded that DEBTRL and DEBTFG leads to significant drop in Nigerians' debt profile, while BMD contributed to deterioration of public debt sustainability. The study recommended that government should devise measures aimed at diversifying the economy aimed at improved revenue inflows. On another hand a policy measure should be evolve to seek for debt forgiveness in order to reduce Nigeria's debt profile.*

Keywords: Bond Market, Debt Conversion, Debt Forgiveness, Debt Management**,** Debt Refinancing,

JEL Classifications: G3, M41

1. Introduction

Annually governments make annual budgetary provisions for capital and recurrent expenditures based on expected revenues from varying sources. Giving financial backing to these budgetary provisions may be a great challenge, especially in developing economies that rely on volatile revenues from unrefined natural resources. In situation where the expected revenue is in deficit to annual expenditures, the government may resort to debt financing to augment the shortfall. These debts sourced from external and domestically if not optimally managed may result in debt traps, with its inherent effects on the economy. Rafindadi and Musa (2019) asserted that optimal management of public debt finances leads to improved economic growth and country's' fiscal sustainability.

Furthermore, it has been noted that capital market development plays a significant role in any economy through mobilization of financial resources to facilitate government fiscal and monetary policies (Xavier & Anahais, 2020). The bond market is a major constituent fulcrum of capital markets, such that Khalid and Rajaguru (2018) opined that it has served as spring board for economies with limited investment and savings prospect to achieve financial sector development. An underdeveloped market affect the amount and maturity of funding made available by institutional investors to government to borrow domestically, which can consequently substantially increase the rollover and currency risks in managing public debt (Shah, Jobst, Valderrama-Ferrando& Guerra, 2007). Similarly, poor debt management practices by government could result in fragmentation of debt instruments issuance. Therefore, lack of a liquid benchmark yield curve could hinder ability of borrowers to assess long-term financing, which could result in undermining institutional investors' ability to apply appropriate risk management.

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The period of oil boom between 1970s and 1980s experienced a significant upsurge in Nigeria debt profile that was fuelled mainly by emergence of import

oriented consumption pattern, which led governments into increased external borrowings. Another precipitating factor was misapplication of borrowed fund on unproductive and uneconomical projects. Nigeria like most developing economies in Africa, despite 2005 debt reliefs by international financial institutions has continued to experience upsurge in it debt profile. Again, Nigeria revenue plummet between the period 2014 to 2019 , which was fuelled by significant decrease in foreign exchange earnings caused by drop in global crude oil prices. The outbreak of COVID 19 pandemic globally in 2020 further aggravated Nigeria precarious revenue stance as crude oil price further dropped significantly. Nigeria faced challenge of shortfalls in finance for development projects and evolving stimulus measures for recovery from economic recession in 2016 and negative economic effect of COVID 19 pandemic, amidst high proportion of recurrent expenditures. Thus, governments embark on aggressive borrowings both from external and internal sources to finance long and short-term projects.

Debt management office established in 2001 by the Federal Government of Nigeria is saddled with the responsibility of ensuring optimal debt management that encompasses debt service forecast, debt service repayments, and advising on debt negotiation as well as new borrowings (DMO, 2019). The centralization of debt management is largely aimed at preventing uncoordinated borrowing that may result in debt overhang, which may affect economic reforms, stable monetary policies, export promotion and a reduction in certain trade barrier (Rafindadi and Musa, 2019). In addition, it has been stated by the IMF and World Bank (2001) that debt management objectives of a country entails that the financing needs and payment obligations of governments should be achieved at the lowest possible cost over the medium to long run, consistent based on prudent degree of risk. The Debt Management Office of Nigeria base on debt management strategy is anchored on DCV, debt restructuring, DRF, debt rescheduling, debt buy-back and DF (DMO, 2013, 2016).

Despite concerns by varying stakeholders, government continued to insist that debt to GDP is still within the acceptable threshold and it has a robust framework that guide it debt management strategies. Thus, this problem has prompted researchers and experts in public financial management to suggest prudential limits on public debt-to-GDP ratios. Empirical evidences have found that suboptimal structured debt in terms of maturity, currency or interest rate composition, and large unfunded contingent liabilities, have been an important factor in inducing or aggravating economic crises in many countries. Thus, based on the aforementioned problems, this study controlled for bond markets development to assess the impact of debt management strategies in Nigeria in terms of debt refinancing (DRF), debt conversion (DCV) and debt forgiveness (DF) on the Nigerian public debt profile sustainability.

2.0 Literature Review

Studies have been conducted on effect of debt management strategies, but most studies focused it relationship with economic growth or determinants of public debt. There seems to be paucity of researches on its effect on total public debt profile. Studies such as Udoka and Anyingang (2010) examined the effect of external debt management policies on economic growth in Nigeria. The study found GDP, exchange rate, fiscal deficit, London Interbank offered rate, and terms of trade to be significantly affect external debt in Nigeria. Uche, Emma & Uche (2014) examined the effect of external debts management strategies on Nigeria economy. The study found that size of External Debts and Gross Domestic Product (GDP), Capital Expenditure, External Reserves and Exports are positively significantly related.

A study that is similar to this research is Rafindadi and Musa (2019) that examined the impact of debt management strategies on the Nigeria's public debt profile. The study found that DRF has negative impact on total debt profile in Nigeria. In addition to that, DF was detected to have significant negative impact on the debt profile of the country. While, DCV on its part was

found to be having significant effect on the Nigeria's debt profile. Woo and Kumar (2015) focused on the impact of initial debt level on real GDP per capita. The study found evidence for the threshold of initial debt-to-GDP ratio, having larger negative effect on the growth in the future. Whereas, Afonso and Jalles (2013) found no evidence that the GDP growth of the countries with high levels of debt to GDP is different from ones with low debt ratios.

Eze (2019) found that external debt has a negative and significant impact on GDP while domestic debt has a negative and insignificant effect on GDP. In addition, government expenditure was found to positively significantly affect GDP, while national savings and consumer price index had insignificant effect on LGDP. The results also showed that external debt has a negative and significant impact on LPUINV, while LDD has a positive and insignificant effect on LPUINV. Lucky and Godday (2017) found that total public debt have a positive significant effect on gross domestic product in Nigeria, while external debt negatively significantly influence on economic growth, the domestic debt has a positive significant effect on the economic growth. Shkolnyk and Koilo (2018) examined the relationship between external debt and economic growth in emerging economies for the period 2006–2016. The study established that high level of external debt and macroeconomic instability retards economic growth. The result showed that emerging economies are burdened by a critical level of debt burden while marginal impact of external debt on economic growth becomes negative.

3.0 Research Methodology

Autoregressive Distributed Lag (ARDL) model was applied to ascertain the effect of public debt management strategies on Nigeria debt sustainability, using times series data for the period 1990-2018. The ARDL model was employed as it allows for estimation explanatory variables that are stationary at either levels I(0) or first difference I(1) as noted by Pesaran, Shin, and Smith (2001). It also allows for co-integration relationship to be estimated by the ordinary least square (OLS) after determining the lag order of the model. The model can also be applied to estimate both the long run and short run parameters of the models when co-integration exist (Adeleke, & Awodumi, 2018). The study used total debt to GDP as proxy to represent debt profile sustainability, while debt refinancing (DRF), debt conversion (DCV) and debt forgiveness (DF) are proxies of public debt management strategies. The study also controlled for bond markets development, which is measured by Bond Market Development index (BMD). The bond markets development index is the composite index of three bond markets indicators: public sector bonds, private sector bonds and international bonds.The model to establish the interactive effects among the variables it is expressed in functional linear form as:

$$TDEBT_t = f\left(DEBTCV_t, DEPTRL_t, DEBTFG_t, BMD_t\right) \ldots\ldots\ldots\ldots\ldots$$

The study conducted post estimation diagnostic test for autocorrelation using Bruesch-Pagan test and stability of the model test based on CUSUM and CUSUM of Square. The ARDL model which is transformed into natural logarithmic is specified, thus:

$$\Delta TDEBT_{t-1} = \alpha_0 + \beta_1 LTDEBT_{t-1} + \beta_2 LDEBTCV_{t-1} + \beta_3 DEBTRL_{t-1} + \beta_4 DEBTFG_{t-1} + \beta_5 BMD_{t-1} + \sum_{p}^{p} \beta_6 \Delta LTDEBT_{t-1} + \sum_{p}^{p} \beta_7 \Delta LDEBTCV_{t-1} + \sum_{p}^{p} \beta_8 \Delta LDEBTRL_{t-1} + \sum_{p}^{p} \beta_9 \Delta LDEBTFG_{t-1} + \sum_{p}^{p} \beta_{10} \Delta BMD_{t-1} + \varepsilon_{it}$$

Where:

LTDEBT = Log Total Debt/GDP
LDEBTCV = Log Debt Conversion
LDEBTRL = Log Debt Relief
LDEBTFG = Log Forgiveness
BMD = Bond Markets Development index
Δ = represents the first difference operator
ε_{it} = Vector of the error term

α_0 = Constant

β = Coefficients

$t-1 = Lag\ of\ time\ t$

To determine existence or otherwise of co-integration in the variables the bound test is conducted. According to Pesaran et, al. (2001) the regressors are assumed to be integrated of order zero I(0) or are integrated of order one I(1). The decision criteria is that if the F-statistic is less than I(0) bound, the null hypothesis (no co-integration) cannot be rejected. Conversely if the F-statistics exceeds the I(1) bound the null hypothesis is rejected.

4.0 Result and Discussion of Findings

The results of descriptive statistics, serial correlation, cointegration, and stability are presented in this section. The result of descriptive statistics shows the mean, standard deviation, skewness, kurtosis and the Jarque-Bera statistics of the coefficients. The result of descriptive statistics depicted in table 1 shows highest standard deviation exist in LDEBTCV, which indicates it has highest variability. The result also shows LTDEBT and LDEBTCV are negatively skewed. The result of normality test using Jargue Bera statistics shows that the probability values of all the variables are above 0.05 level of significance, thus suggest they are normally distributed.

Table 1: Descriptive Statistics of the Variables

	LTDEBT	LDEBTCV	LDEBTFG	LDEBTRL	BMD
Mean	8.6983	6.0036	9.3061	8.9803	8.2361
Median	8.948	6.1201	9.3221	8.6239	8.2521
Maximum	10.6949	8.5409	11.6034	12.741	10.5334
Minimum	5.7502	2.7084	8.2195	6.3161	7.1495
Std. Dev.	1.3622	1.8096	0.6969	1.4673	0.6499
Skewness	-0.5116	-0.334	0.7099	0.8536	0.6629
Kurtosis	1.7565	1.4351	3.216	3.5514	2.146
Jarque-Bera	1.9351	2.4012	3.4015	4.9979	2.3315
Probability	0.3444	0.2665	0.1498	0.0509	0.1028
Sum	255.4061	182.6475	271.8163	263.0181	192.7463
Sum Sq. Dev.	50.8769	91.1289	10.2576	59.3976	9.1876

Source: Extracts from Eviews Output

The correlation matrix shown in the table 2 indicates negative relationship exist between LDEBTCV, LDEBTFG and TDEBT, while positive relationship exist between LDEBTRL, BMD and TDEBT. Thus, it is noted that the highest correlation among the variables is 0.690979, this indicates multicollinearity problem does not exist among the independent variables as all the values are below the threshold of 0.8 for existence of high multicollinearity problem between independent variables as suggested by Rumsey (2007). Thus, variables employed in the study are statistically appropriate for inclusion in the model used for estimation.

Table 2: Correlation Matrix

Variables	LTDEBT	LDEBTCV	LDEBTRL	LDEBTFG	BMD
LTDEBT	1				
LDEBTCV	-0.17407	1			
LDEBTRL	0.690979	0.077257	1		
LDEBTFG	-0.25574	0.540315	-0.08616	1	
BMD	0.3427	0.4332	0.4098	0.3133	1

Source: Extracts from Eviews Output

The time series properties of the variables for existence of unit root were examined using Augmented Dickey-Fuller (ADF) unit root test. The results of the ADF tests as shown in table 3 indicates all the variables used in the study are integrated of order I(1) except for LTDEBT and BMD that are stationary at level.

Tables 3: Augmented Dickey-Fuller (ADF) Unit Root Tests

Variable	t-Statistic	Order of Integration
LTDEBT	-2.25349	I(0)
LDEBTCV	-6.29516	I(1)
LDEBTRL	-3.77119	I(1)
LDEBTFG	-6.55294	I(1)
BMD	-3.44229	I(0)

Source: Extracts from Eviews Output

The results for the ARDL bounds test for co-integration as illustrated in table 4 shows the F-statistics of 4.9886 is higher than the I(1) upper bound value of 3.807 at 0.05 level of significance. Thus, there is co-integration relationship between the variables estimated. Thus, the Error Correction Model (ECM) was specified. The result of lag length criteria test using AIC indicates a lag of 1 is appropriate.

Table 4: ARDL bounds test for Co-integration

ARDL Bounds Test		
F-statistic 2.1234 AIC (Lag 1)		
Bounds Significance Level	I(0) Bound	I(1) Bound
10%	2.247	3.317
5%	2.657	3.807
2.50%	3.047	4.287
1%	3.537	4.857

Source: Extracts from Eviews Output

The long-run ARDL estimation results in table 5 for establishing the effect of public debt management and Nigeria Debt Profile indicates that Debt conversion (LDEBTCV) do not significantly affects TDEBT. Conversely, the long-run estimates shows long run negative significant relationships exist between LDEBTRL, LDEBTFG and TDEBT, while BMD shows long run positive significant relationships with TDEBT. This suggests that LDEBTRL and LDEBTFG

lead to decrease in TDEBT, but BMD contributes to growth of TDEBT.

Table 5: Results of Long-run estimation using ARDL approach

Variable	Coefficient	Std. Error	t-Statistic
C	3.0055	0.5449	5.4942
LDEBTCV	-0.0122	0.0143	-0.595
LDEBTRL	0.7744*	0.026	2.4534
LDEBTFG	-0.1418*	0.056	2.3903
BMD	0.4224*	0.021	1.4337

Source: Extracts from Eviews Output. Note: *, ** and*** denote the level of significance at 1%, 5% and 10% respectively.

The Result of short-run estimation in table 6 indicates that the outcomes did not differ from the long-run estimation as LDEBTRL and LDEBTFG are statistically negatively significant, while BMD is positively significant. Furthermore, the negative coefficient of the error correction term (ECM) indicates that 29% deviation from the long-run equilibrium level of public debt management strategies to total debt is corrected for annually.

Table 6: Results of Short-run ECM Estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.0845	0.0589	1.3752	0.1765
D(LDEBTCV)	-0.2216	0.0029	-1.2578	0.2203
D(LDEBTRL)	0.1293*	0.0065	-1.4784	0.0117
D(LDEBTFG)	0.1079**	0.1274	0.8484	0.0323
D(BMD)	0.2044**	0.1214	0.4013	0.0212
ECM(-1)	-0.2963*	0.3799	0.2195	0.0147

Source: Extracts from Eviews Output. Note: *, ** and*** denote the level of significance at 1%, 5% and 10% respectively

The results of post estimation diagnostic and specification tests as shown in table 7 indicates that the model used for the study are correctly specified as the Breusch-Godfrey LM test statistics for autocorrelation rejected the existence of serial correlation, thus Breusch-Pagan-Godfrey confirms that the residuals are homoscedastic.

Table 7: Result of Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	2.116601	Prob. F(2,19)	0.1908
Obs*R-squared	4.965134	Prob. Chi-Square(2)	0.1303

Source: Extracts from Eviews Output

The result of post estimation model stability test using CUSUM indicates it lies within the 5 percent significance level. Thus, the model used for the study is stable and could be applied for estimation.

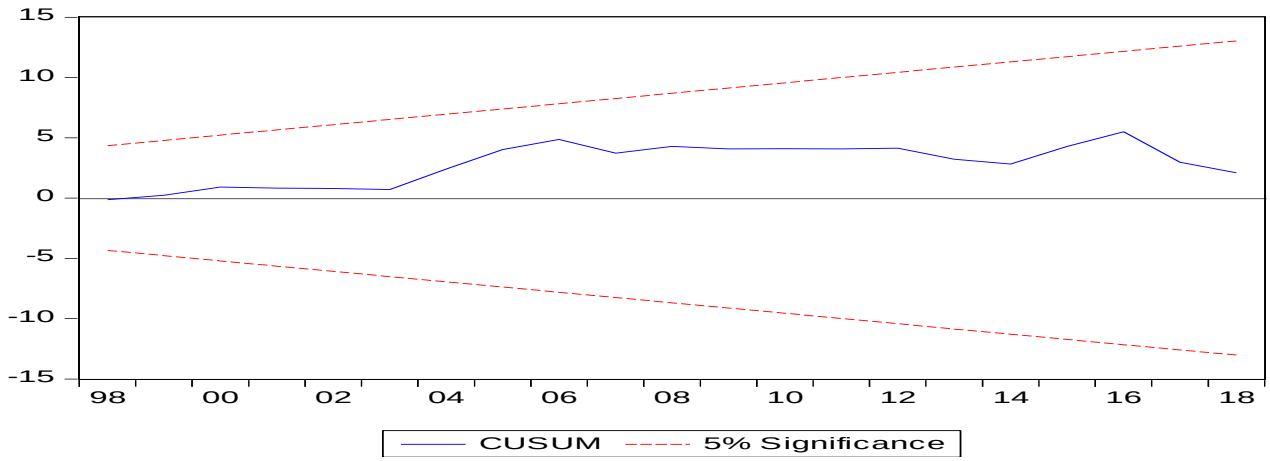

Figure 1: Result of Stability test
Source: Extracts from Eviews Output

5.0 Conclusion and Recommendations

The study examined the effect of public debt management strategies on Nigeria debt profile for the period 1990-2018, using the Autoregressive Distributed Lag (ARDL) model for estimation. The study employed total debt/GDP to represent debt profile, while debt refinancing (DRF), debt conversion (DCV) and debt forgiveness (DF) are proxies of public debt management strategies, and Bond Market Development (BMD) is used as control variable. The result of estimation shows evidence of co-integration between the variables. The long-run estimation reported insignificant effect between LDECOV and TDEBT in Nigeria. But, negative significant relationship exists between LDEBTRL, LDEBTFG and TDEBT, while positive relationship exists between BMD and TDEBT. The short-run coefficients also indicate LDEBTRL, LDEBTFG and TDEBT are statistically negatively significant, while BMD is statistically positively significant. The government should devise measures aimed at diversifying the economy aimed at improved revenue inflows. On another hand policy measure should be evolve strategies to seek for debt forgiveness in order to reduce Nigeria's debt profile sustainability.

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