Lapai Journal of Economics; Volume 5, No.2; 2021
Print ISSN: 2659-028X
Online ISSN: 2659-0271
Published by Department of Economics, IBB University Lapai, Niger State, Nigeria

Impact of COVID-19 on External Debt in Nigeria

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DOI: 10.5281/zenodo.6348997

Abstract
External debt is very important for the growth of any economy. It is basically used for augmenting the revenue of a country and to finance, sometimes, long-term capital project, for which domestic debt cannot be adequate. The COVID-19 pandemic came up with increase in government expenditure and fiscal deficit. This may not be unconnected to COVID-19 induced expenditure like buying of COVID-19 test kit, evacuation of Nigerian nationals in different parts of the World, to mention but a few. The current effort investigates the effect of COVID-19 on external debt in Nigeria. Vector Autoregressive Model was employed as the estimation technique after testing for the stationarity of the variables. It was found that past external debt, exchange rate and fiscal deficit are the major determinants of external debt in Nigeria. The study also found out that COVID-19 exerts a weak influence on external debt in Nigeria. The study therefore recommend the urgent need of the government in switching and streamlining discretionary spending in order to make resources available to fund the COVID-19-related economic effect.

Keywords: COVID-19, External Debt, Vector Autoregressive
JEL Classification: F34, I18

1. Introduction

Foreign borrowing is usually contracted to achieve two major macroeconomic objectives. These include increase in investment or consumption as well as financing temporary balance of payment deficit (Akinwunmi & Adekoya, 2018). As a result economy indulges in external borrowing to accelerate economic development and bridge the gap between national revenue and expenditure. Foreign borrowing leads to increase in growth rates of employment and income, technological progress through the improvement in domestic investment and income thereby leading to higher consumption and savings levels. This will consequently leads to increase in export and imports.

However, financing economic development through foreign borrowing imposes an instantaneous obligation of interest rates payments which has to be made in foreign exchange (Onikosi-Alliyu, 2015). To meet this contractual foreign debt service responsibility or obligation, external loans must be capable of generating additional foreign exchange through investment. Hence, excessive foreign loans or borrowing for inappropriate recurrent purposes will generate debt service obligations that will constrain future economic policy as well as economic growth (World Bank, 2020).

Moreover, Coronavirus disease, 2019 (COVID-19), is a newly identified virus that first made it appearance in a food market in Wuhan, China, in the late 2019. The virus has accounted for millions of confirmed cases globally, as well as deaths (WHO, 2020). The novel virus spreads rapidly across the globe, with confirmed increase in cases and fatality rate on a daily basis, as it is easily transmitted through air and human interaction. To curb the spread of this virus, severe measures such as compulsory lockdown and border closure were embarked on by the whole world (Ibn-Mohammeda, 2020). These measures have consequently disrupted the economic activities all over the globe. Hence, the challenges of COVID-19 on public health transcend into crucial economic crisis within a very short time.

The emergence of COVID-19 coupled with the fall in the price of oil crowned the fiscal challenges of the country through significant shortfall in revenue and induces COVID-19 expenditures. To cushion the effect of the pandemic Nigerian government came up with different fiscal and monetary policies through massive stimulus packages for her citizen such as, health costs, COVID-19 test kit, stimulus packages for businesses, and enlarged social support for susceptible households (Anderm et.al 2020)

Nigeria being an oil-dependent economy, one of the direct consequences or effect of COVID-19 is the reduction in federal government revenue through its impact on oil prices. Oil prices fell by 45 percent to around USD 30 per barrel in the first quarter of 2020 (Akanni & Gabriel 2020). Another factor contributing to persistent drop in international oil and gas prices during covid-19 pandemic was the sharp drop in global oil and gas consumption, which owned to the fact that major production and manufacturing activities in the world's major industrial capitals came to a halt as a result of the coronavirus pandemic, with the resulting economic implications on the increase.

The effect of COVID-19 on economy at the country level perspective is highly desirable and inevitable because of its importance to policy direction (Olubusoye and Ogbonna, 2020). While studies have dealt with notable areas like the effect of COVID-19 on macroeconomic issue like inflation, economic growth, investment etc, its effect on external debt had not been empirically tested, hence, one major pertinent question that needs to be answered is; what is the effect of the corona virus pandemic on external debt in Nigeria? Therefore the current effort is to empirically investigate the impact of COVID-19 pandemic on external borrowing in Nigeria using a quarterly data that spanned from 2010 through 2020 and to study the determinants of external debt in Nigeria during COVID-19 pandemic. To do this the paper is divided into five sections. Section one introduces the title, followed

by literature review in section two, section three explains the methodology, section four present the results analysis, while section five concludes the study.

2. Literature Review

The theoretical literature on the determinants of external debt is mainly discussed under the theory of 'dual-gap' theory propounded by Harrod (1939), Domar (1946), Chenery and Strout (1966), and Bacha (1990). These models emphasized that the output gap, fiscal deficit and trade balance constraints are the major reason for contracting external debt. Empirical studies like Greenidge, Drakes and Craigwell (2010), Anwan, Rajun and Rashin (2015) Beyene and Kotoss (2020) among others have conducted research on the determinants of external debt in different countries. Greenidge, et.al. (2010) investigated the determinants of external public debt in the Carribean community using a panel and cointegration estimation technique. The study found out that the major determinants of external debt in Carrabian countries are output gap, export, real effective exchange rate, real cost of borrowing and fiscal gap. Anwan, *et. al*. (2015) also examined the determinants of external debt in Pakistan using Cointegration and Autoregressive techniques for the period of 1976 to 2010. They concluded that Fiscal deficit, nominal exchange and trade openness are the major determinants of external debts in Pakistan. In recent time, Beyene and Kotoss (2020) found that the major determinants of external debt are the savings-investment gap, fiscal deficit, trade deficit and debt service in Ethiopia.

In Nigeria, Adamu and Rasiah, (2016) investigated the determinants of external debt for the period of 1970 and 2013 using Cointegration and ARDL techniques. Their study concluded that oil price, gross domestic savings and external service payment are the major determinants of external debt in Nigeria. They also concluded that exchange rate and fiscal deficit contributes to external debt accumulation in Nigeria. In the same regard, Sa'ad, Umar, Waziri and Maniam, (2017), also conducted research on external debt determinants for the period of 1973 through 2017. They found out that only gross domestic product is significant in both the short run and long run analysis. The study also revealed that the coefficient of error correction was significantly different from zero. Moreover, researchers have key in into the study of the impact of COVID-19 since its emergence in the world. Ozili (2021) used a textual approach to analyse the impending COVID-19 global debt problem for low and medium income economies. According to the study, during the COVID-19 pandemic, the debt burden of low and middle-income nations increased to $8.4 trillion by the end of 2020. The study recommends that multilateral organisations should allow impacted members to access their contribution money, support the G20 Debt Service Suspension Initiative, and advocate for debt relief. Geda (2021) demonstrated the socioeconomic impact of the COVID-19 pandemic on a tiny mineral-dependent African economy like Zambia through descriptive analysis. It focuses on GDP and sectoral GDP growth, employment, and the external sector in particular. The findings suggest that the recovery of the global economy is critical for small countries that rely on a single (or a few) key commodities for their growth and development. The study also showed that there is a shortage of fiscal headroom to cope with COVID 19's economic effects without causing macroeconomic

instability, such as indebtedness and the inability to service debt that has already been incurred.

Olamide and Maredza (2021) used the ARDL technique on time series data from 1990 to 2019 to study a pre-COVID-19 depiction of the current scenario in South Africa regarding the foreign debt-GDP relationship. The authors also discussed what was known about the debt-GDP concept prior to the COVID 19 epidemic. This is likely to act as a springboard for future research into South Africa's mounting debt during and after the pandemic. According to the findings, corruption, inflation, and external debt payment have negative effects on economic growth, but investment has a favorable impact. External debt had a beneficial short-term impact on growth but a detrimental long-term impact. As a result, they urge that, in addition to targeting tax evaders and avoiders for higher government revenue, public institutions be improved and strengthened. Akomolafe et.al (2020) studied the impact of COVID-19 on the economy of Nigeria using a historical approach. The demand and supply shocks were considered and the study found out that the new shocks caused by COVID-19 pandemic have caused a significant downturn of the economy in Nigeria. Adam et.al. 2020 estimated the economic cost of COVID-19 in Nigeria using a simulation approach. They concluded that during the lockdown Nigeria's gross domestic product suffered 34.1% loss due to COVID-19 from the services sector while agricultural sector suffered 13.1 per cent loss in output. Olubusoye and Ogbonna (2020) studied the impact of COVID-19 on some macroeconomic variables such as Oil-price exchange rate, all share index inflation and output growth using a simulation approach. They concluded that COVID-19 has negatively impacted on all the aforementioned variables. Olusanya *et al* (2020) studied the impact of COVID-19 and Nigeria economy and found out that COVID-19 is negatively related to macroeconomic variables. Also the country's budget estimate is also negatively affected, given the large changes between the budget assumptions and stance during the COVID-19 pandemic. Consequently, more than 50% of the country's budget would have to be funded by external borrowing, hence increasing the debt burden of Nigeria further.

Based on an examination of secondary information and the use of a discursive method, Ejiogu, Okechukwu, and Ejiogu (2020) explored the Nigerian government's fiscal response to the COVID-19 pandemic as well as the economic and social consequences. Their study is of the view that, increased borrowing to implement COVID-19-related economic and social initiatives has considerably reduced Nigeria's budgetary capacity. To them, some measures bring short-term economic respite to the poor and small enterprises, while other interventions and policy gaps have the propensity to have a large detrimental impact on firms, consumers, and unemployment. The researchers gave a detailed description of the Nigerian government's fiscal response to the COVID 19 outbreak, as well as the economic and social consequences of that response.

3 Methodology

This study is to investigate the impact of COVID-19 on external debt in Nigeria. Quarterly data set spanning from 2010 to 2020 was used, and the data set for all the variables was obtained from Central Bank of Nigeria statistical bulletin various

isssues except oil price obtained from World Development Indicator. The External Debt Stock is measured as a share of GDP, Oil Price measured as crude oil price per barrel, Exchange Rate measured as Official exchange rate (Exchange rate of Nigerian Naira to U.S. Dollar), External Debt service payment measured as debt service as a percentage of exports, Fiscal Deficit measured as Government fiscal deficit as a share of GDP, and Dummy variable with the quarter affected by COVID-19 captured as one while other periods were captured by zero. This study estimates the model by using a quarterly series data regression after testing for the unit root and cointegration status of the variables, the study employed Autoregressive Distributed Lag method of analysis to investigate the effect of COVID-19 on external debt. The study adapted the model of Adamu and Rasiah (2016). The empirical model for this study is therefore specified as:

exd = $\alpha_0 + \alpha_1 oilp + \alpha_2 er + \alpha_3 edsp + \alpha_4 def + \alpha_6 dummy + \mu$ …… 1

where exd is external debt stock, oilp refers to oil price, exr stands for Exchange rate, edsp represent External debt service payments, def is Fiscal deficit, Dummy is dummy variable for COVID-19 such that $oilp < 0, er, edsp\ def > 0, \& \ cov > 0$

4. Results

Unit Root Test Result

The study employs the Augmented Dickey-Fuller's unit root test to understand the properties of the data set and hence, choose appropriate method of analysis. The result is presented in Table 1:

Table 1: Unit root test results

Variable	At level	At First Difference	Critical Value	Order of Integration
LOG(EXD)	2.207695	-5.357259	-2.938987	I(1)
LOG(EDSP)	-1.736556	-6.699554	-2.941145	I(1)
LOG(DEF)	1.252877	-6.264286	-2.941145	I(1)
LOG(EXR)	-0.153822	-5.996695	-2.936942	I(1)
LOG(OILP)	-0.324579	-3.872002	-2.936942	I(1)

Source: Authors Computation

The result presented in Table 1 shows that all the variables are stationary at first difference i.e all variables are integrated of order 1. These results, therefore, justify the use of Vector Autoregressive method of estimation.

Lag Length Selection

The study moves further to test for the lag length of the variables. The result is presented in Table 2

Table 2:: Lag Length Selection

Lag	LogL	AIC	SC
0	13.82172	-0.368742	-0.063974
1	56.37782	-2.615017*	-2.266711*
2	56.49604	-2.567353	-2.175509
3	57.45529	-2.565151	-2.129768
4	57.51415	-2.514278	-2.035357

Source: Authors Computation

Using Akaike Information criterion the result indicates that the lag length of the variables is order one as presented in Table 2

VAR Result
The VAR result for external debt is presented in Table 3:

Table 3: VAR Result

	LOG(EXD)	LOG(EXR)	LOG(EDSP)	LOG(OILP)	DEF	DUMMY
LOG(EXD(-1))	0.933714	0.070216	0.551636	-0.208465	-302.0029	0.023782
	(0.04196)	(0.04831)	(0.41778)	(0.10022)	(184.195)	(0.11047)
	[22.2501]	[1.45343]	[1.32040]	[-2.08008]	[-1.6395]	[0.21528]
LOG(EXR(-1))	0.249439	0.772977	0.390957	0.353627	-429.6955	0.155098
	(0.07784)	(0.08961)	(0.77490)	(0.18589)	(341.648)	(0.20490)
	[3.20465]	[8.62630]	[0.50452]	[1.90235]	[-1.2577]	[0.75693]
LOG(EDSP(-1))	-0.010542	-0.040572	-0.045917	-0.010392	-114.7137	0.013516
	(0.01724)	(0.01985)	(0.17168)	(0.04118)	(75.6909)	(0.04540)
	[-0.61132]	[-2.04369]	[-0.26746]	[-0.25233]	[-1.5155]	[0.29775]
LOG(OILP(-1))	0.017804	-0.096011	0.398361	0.979772	81.93900	-0.021692
	(0.03318)	(0.03819)	(0.33028)	(0.07923)	(145.617)	(0.08733)
	[0.53667]	[-2.51387]	[1.20614]	[12.3662]	[0.56270]	[-0.2483]
DEF(-1)	6.55E-05	-8.59E-05	-0.000382	-2.77E-05	0.006310	0.000319
	(3.8E-05)	(4.4E-05)	(0.00038)	(9.1E-05)	(0.16680)	(0.00010)
	[1.72469]	[-1.96420]	[-1.01093]	[-0.30563]	[0.03783]	[3.19113]
DUMMY(-1)	0.039569	0.022934	0.048543	0.628814	34.47210	0.832653
	(0.05872)	(0.06760)	(0.58457)	(0.14023)	(257.731)	(0.15457)
	[0.67389]	[0.33927]	[0.08304]	[4.48413]	[0.13375]	[5.38674]
C	-0.695481	1.118623	-4.188069	-0.464158	4694.895	-0.707918
	(0.37168)	(0.42789)	(3.70027)	(0.88765)	(1631.42)	(0.97844)
	[-1.87117]	[2.61429]	[-1.13183]	[-0.52291]	[2.87780]	[-0.7235]
R-squared	0.993058	0.969178	0.504860	0.905400	0.760941	0.636495
Adj. R-squared	0.991833	0.963739	0.417482	0.888706	0.718754	0.572347

Source: Authors Computation

The result indicates that the past realization of external debt is associated with 93.37 per cent increase in external debt. Going by the t-statistic the effect is highly significant at 5 per cent significant level. External debt service payment (EDSP) has a negative impact on external debt. This simply means increase in external debt service will lead to non-association with accumulation of external debt, though the impact is not significant. In addition the coefficient of exchange rate is significantly positive as expected. A one percent increase in exchange rate will lead to about 24.94 percent increase in external debt. Oil price also exerts a positive insignificant impact on external debt. This simply means that a percentage increase in the price of oil will lead to increase in external debt. This is contrary to apriori expectation. The differential Intercept coefficient of COVID-19 is positive but statistically not significant. The coefficient of determination indicates that 99.2 per cent variations were explained by the dependent variables. F-Statistic shows that the model is of good fit.

Diagnostic Test

Table 4: Residual Serial Correlation Test

VAR Residual Serial Correlation LM Tests		
Lags	LM-Stat	Prob
1	47.90900	0.0885
Probs from chi-square with 36 df.		

Source: Authors Computation

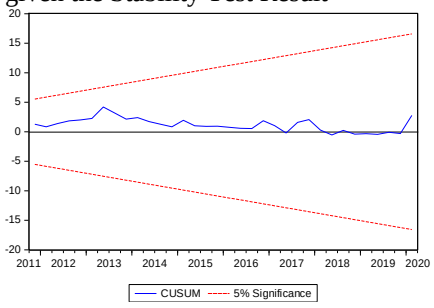
Table 4 shows the Residual Correlation LM test result. This is used to test for absence or presence of serial correlation in the model. Null hypothesis of no serial correlation is accepted as the probability value is greater than 0.05 level of significance. We then conclude that error terms are not serially correlated and therefore, there is absence of serial correlation among variables in the model.

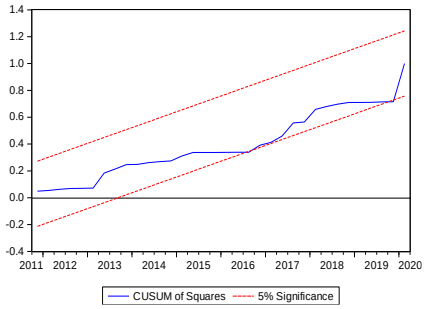
Table 5 Heteroskedasticity Test

VAR Residual Heteroskedasticity Tests		
Chi-sq	df	Prob.
242.0488	210	0.0639

Source: Authors Computation

The Heteroskedasticity Test presented in Table 5 confirms that the model is stable given the Stability Test Result





The result of the stability tests which is based on CUSUM and CUSUM squared stability test is presented in figure 2 and 3. Both graphs indicated that the model passes the stability test and hence the residual is stable. This is because the trend line is in between the two critical lines as seen in the figure 2 and 3 above.

The variance decomposition is presented in Table 6. The result shows that in the short run external debt contributes 100 per cent to itself while all other variables are strongly exogenous. However, the contribution of external debt continues to decrease in the long run. By the tenth period, the contribution of external to itself reduced to 48.53 percent. Log of exchange rate also contributes to external debt by 3.99 per cent in the short run to variable and it continues to increase in the long run. In fact, the percentage of contribution increased to 26.10 in the tenth period. This simply corroborates the positive influence of exchange rate on external debt in Nigeria. All other variables including COVID-19 indicate weak influence on external debt in Nigeria.

Table 6 Variance Decomposition of log of EXD

Period	S.E.	LOG(EXD)	LOG(EXR)	LOG(EDSP)	LOG(OILP)	DEF	DUMMY
1	0.0541	100.000	0.0000	0.0000	0.0000	0.0000	0.0000
2	0.0745	89.7958	3.9885	1.6101	0.0160	4.2189	0.3703
3	0.0905	78.9816	9.0527	4.9683	0.0109	5.4790	1.5072
4	0.1050	68.9439	14.4652	6.9887	0.1115	6.5290	2.9614
5	0.1187	60.7848	19.3088	8.1945	0.6108	7.1108	3.9899
6	0.1320	54.9305	23.2542	8.6132	1.8198	7.1758	4.2062
7	0.1453	51.2476	26.096	8.3728	3.8692	6.6824	3.7312
8	0.1595	49.3186	27.603	7.5985	6.6128	5.7639	3.1026
9	0.1761	48.6033	27.573	6.4728	9.5893	4.7328	3.0282
10	0.1964	48.5386	26.064	5.2371	12.1699	3.9752	4.0143

Source: Authors Computation

Discussion of Result

The result of exchange rate is in line with studies like as Adam and Rasiah (2016) and Anwan et.al (2015) that showed that exchange rate is an increasing function of external debt. The coefficient of the fiscal deficit conforms to the apriori expectation by being positive and it has significant impact on external debt at 10 per cent significant level. This shows that a percentage increase in fiscal deficit will lead to about 0.00006 percent increase in external debt. This results corroborates the study of Adamu and Rasiah (2016), Anwan et. Al and Greenidge et al (2010). This result clearly supports the fact using external borrowing to finance fiscal deficit would always lead to accumulation of external debts due to extra outflow from the country's increase in debt repayment service. On COVID-19 the differential coefficient was an increasing but insignificant function of external debt. This effect shows that the increase in external debt may not be connected to COVID-19 in Nigeria.

5. Conclusion and Recommendation

This study empirically studies the determinants of external debt and the effect of COVID-19 on external debts in Nigeria using a quarterly data set from 2010-2020. The study adopted VAR model as the best estimation method after testing for unit root and orders of integration. Based on the findings, the study concluded that past external debt stock fiscal deficit, exchange rates are the major determinants of external debt accumulation in Nigeria. The study also concluded that COVID-19 has no significant contribution to external borrowing in Nigeria. The policy implication of these findings is that the policy makers should ensure that while solving the problem of COVID-19, close monitoring and transparency should be ensured on the external borrowing. In addition, the study suggested that the government should restructure and consolidate discretionary spending in order to free up resources to fund the COVID-19-related economic effect. The domestic post-pandemic policy should also focus on ensuring the confidence of investors by restoring fiscal sustainability.

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