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External Debt, Debt Servicing and Poverty Reduction in Nigeria: An Empirical Analysis

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Abstract
This study utilizes co integration and regression analysis to investigate into the impact of external debt and debt servicing on poverty reduction in Nigeria using data for the period 1980 to 2010. Specifically, three analysis were undertaken, first, the time series properties of the concerned variables were ascertained with the help of the Augmented Dickey-Fuller (ADF) unit root procedures. Second, the long-run relationship among poverty reduction, debt –Income ratio, debt-service degree of openness, growth of agricultural value added, per capital income, inflation rate and investment-income ratio was examined in the context of the Johansen and Juselius (1990) framework. Thirdly, a multiple regression analysis was employed to examine the impact of external debt and debt servicing on poverty reduction. The overall results indicate that both the external debt and debt servicing cause poverty in Nigeria. This finding suggests that government needs to mobilize domestic saving to replace external debt.
Key words: External Debt, Debt Servicing , Poverty Reduction

1.0 Introduction

Most economies especially those in the third world have one time or the other experienced short fall between domestic savings and the desired level of investment. Thus, the underpinning philosophy that underscores external borrowing is the existence of savings – investments gap in a domestic economy. The accumulation of external debt is a common phenomenon of the developing countries where domestic savings is low, current account payments deficits are high, and imports of capital are needed to augment domestic resources to accelerate economic growth and poverty reduction. This becomes effective as long as borrowed funds are properly utilized for productive investment, and do not suffer from macroeconomic instability, policies, that distort economic incentives (Amakom, 2003). Prior to the early 1970s, the external debt of developing countries was relatively small and primarily an official phenomenon, the majority of creditors being foreign government and international financial institutions such as the IMF, the World Bank and regional development banks. Most loans were on concessional (low interest) terms and were extended for purposes of implementing development projects and expanding imports of capital goods. However, during the late 1970s and early 1980s, commercial banks began playing a large role in international lending and issuing general purpose loans to less developing countries to provide balance of payments support and expansion of export sector (Todaro, 2003).

The seed of external debt crisis were actually sewed in 1978, when the country borrowed from international capital market an commercial terms characterized by high and variable interest rates, short maturity and grace period. This has caused the country's debt stock to increase progressively with its adverse effects on the economy. The consequences of this increase include under – utilization of productive capacity and the scaling down of domestic investment and development projects, which could have been used to improve the standard of living of the people thus, continuing increase in the rate of poverty.

It is against this background that this study delve to investigate on the relationship between external debt and debt servicing on one hand and poverty reduction on the other hand.

1.1 Objectives of the Study

The objectives of the study are to

(a) Investigate whether there exists a long-run relationship between poverty reduction on one hand and the degree of openness, Per capital income, inflation and investment on the other hand.
(b) Investigate into the relationship between external debt and debt servicing on one hand and poverty reduction on the other hand.

1.2 Literature Review

Early post-war reflections on the problems of developing countries led to the identification of insufficient capital stock as the cause of their low income. As Singer (1949)put it, the less developed countries suffer from a dominant vicious circle of low production, no surplus for economic development , no tools and equipment which in turn cause low standard of production. Nurtse (1953) puts its differently that the problem of these countries was that there is small capacity to save resulting from low level of real income. The low level of real income is a reflection of low productivity, which in turn is due largely to the lack of capital. The lack of capital is as a result of small capacity to save. It is evident that to break out of this vicious circle of poverty ,a country must increase its savings.

Increased savings as a panacea for under – development was also emphasized by Domar (1957) who indicated that in under-developed countries, it is clearly capital rather than labour that is inhibiting growth, he argued further that since the private sector is the user and sources of savings, government should develop and implement policies which would encourage savings, where the private sector cannot discharge this responsibility, government should shoulder the responsibility by diverting resources to itself through higher taxes (Kalder, 1955).

These considerations were based on the assumption that developing economy has the potential to finance its investment requirement. However given the need for large capital stock and the inadequacy of the domestic savings to finance investment, it was concluded that domestic savings should be supplemented by foreign resources.

1.2.1 Empirical Review of Literature

Most empirical studies have delved into the relationship between either debt and growth, debt and/or poverty and growth.

Mjema (1996) investigate the impact of foreign debt and debt servicing in the economy of Tanzania .He found that the impact of debt service on real growth in Tanzania is negative.

Ajayi and Iyoha (1998), presented an empirical investigation of the impact of external debt on economic growth in the severely indebted low income countries (silics) of sub-saharan Africa. Using data from 1990 to 1997, a simultaneous equations model was econometrically estimated. Debt overhang is shown to have significant depressing effect on growth.

Although the debt overhang models do not analyse the effects of debt on growth explicitly, the implication still remain that large debt stock lowers growth by partly reducing investment with a resultant negative effect on poverty. Stiglitz (2000), contributed that government borrowing can crowd-out investment, which will reduce future output and wages. When output and wages are affected, the welfare of the citizens will be made vulnerable.

Siyanbola (2005) paper state that the debt service obligations and poverty are positively related. A country with a huge debt burden like Nigeria, would find it difficult to utilize available resources for projects that benefit the poor.

Tomori and Adebiyi (2000), demonstrated that the increases in government expenditure on debt service obligations tend to adversely affect development from the distribution perspective, as the poor are likely to receive the short and of the stick in expenditure reduction measures.

Soludo (2003) opined that countries borrow for two broad categories macroeconomic reasons (higher investment, higher consumption, education and health) or to finance transitory balanced of payments deficits (to lower nominal interest rate abroad, lack of domestic long-term creditor, or to circumvent hard budget constraints). This implies that economy indulges in debt to boost economic growth and reduce poverty.

1.2.2 Linkage Between Debt Service and Poverty Reduction

Although foreign borrowing can be highly beneficial, providing the resources necessary to promote economic growth and development, it has its costs. The main cost associated with the accumulation of a large external debt is debt service. Debt service is the payment of amortization (liquidation of the principal) and accumulated interest; it is a contractually fixed charge on domestic real income and savings. As the size of the debt grows or as interest rate rises, debt service charge increases. Debt service payment must be made with foreign exchange. In other words, debt service obligations can be met only through export earnings, curtailed imports, or further external borrowing. However, should the composition of imports change or should interest rate rise significantly, causing a ballooning of debt service payments or should exports earnings diminish, debt servicing difficulties are likely to arise.

In order to link external debt service and poverty reduction, the concept of basic transfer needs to be introduced. The basic transfer of a country is defined by (Todaro, 2003) as the next foreign exchange inflow or outflow related to the international borrowing.Capital inflow in turn is simply the difference between the gross inflow and the amortization on past debt. The basic transfer is an important concept because it represents the amount of foreign exchange that a particular LDC is gaining or losing each year from international capital inflows.

1.3 Methodological Framework

To capture the relationship between external debt and poverty reduction a neoclassical production function is assumed. The production function is of the form given below:

Y = F (L, K, T)……………….. (1)

Where
Y = Output
K = Capital
L = Labour
T = Technical Progress

Equation 1 states that output growth can be enhanced by promoting be physical and human capital. Capital goods are mainly imported and some inputs are domestically produced through the investment process. The labour input is either skilled or unskilled labour. The supply of unskilled labour is not constraint in LDCs, given the huge unemployment pool.

Foreign borrowings allowed a country to maintain domestic investment and economic growth and poverty reduction at levels beyond those that could be financed through domestic savings. Thus, external debt helps to finance development of both physical and human capital. Therefore, a debt augmented neoclassical production function is put thus:

Y = F (L, K,T,E, Z) ……………….. (2)

Where
E = External debt stock
Z= Variables that determines growth

Following this line of reasoning, the model employs in this study closely follows the one employed by James (2003). The model allows for the inclusion of variables that are of great importance to Nigerian economy.

POV = F(DYR, DSR, DOP, GAVA, GNPPC, INF, INVYR)………(3)

Where
POV = :Poverty reduction
DYR =Debt income ratio\
DSR = Debit service ratio
DOP = Degree of openness
GAVA = Growth of agricultural value added
GNPPC= Per capital income
INF = Inflation rate
INVYR = Investment – Income Ratio

1.3.1 Estimating Techniques

In order to avoid potentially spurious regression results emanating from the non-stationarity of the data series, attempt is made to render the data stationary prior to specification and estimation of the various equations. For this reason, the Augumented Dickey Fuller (ADF) set of unit root test due to Dickey and Fuller (1981) is conducted. Also, in order to bring out long-run policy implication of this short-run phenomenon (arising from data differencing); co-integration technique based on standard Johasen co-integration technique, Johasen and Juselius (1990) is employed.

1.3.2 Sources of Data and Measurement of Variables

The period of the analysis is 1980-2010 and the data were derived from publications of Central Bank of Nigeria (CBN). The Annual Reports and Statement of Accounts, Economic and Financial Review, Statistical Bulletin (Various Issues) as well as Publication of National Bureau of Statistic.In investigating the impact of external debt on poverty reduction in Nigeria, the variables as listed in equation 3 were utilized.

Poverty reduction was measured by public expenditure on social goods and services to GDP ratio measured in percentage.Debt income ratio was the ratio of total external debt to GDP measured in percentages.Debt service ratio was the ratio of debt service payment to exports of goods and services measured in percentage.Degree of openness was obtained as the total import plus export to GDP ratio measured in percentage.Inflation rate was taken as the annual growth of consumer price index measured in percentage.Investment – income ratio was measured as Gross Investment to GDP ratio measured in percentages.

1.4 Presentation and Discussion of The Results

Results of the Unit Root Tests

The Augmented Dickey – Fuller (ADF) set of unit root test statistic are calculated in respect of the eight variables in order to test for their stationarity, and to establish the order of integration of each. The null hypothesis of non-stationary of Debt-Service Ratio, Debt-Income Ratio, Degree of Openness. Growth of agricultural value added, per capital income, inflation rate investment-income ratio and poverty reduction are tested against the alternative hypothesis of stationarity.

The results as presented in table 4.1 below indicates that only inflation rate is stationary in its levels, while Debt-Service Ratio, Debt-Income ratio, Degree of Openness, growth of agricultural value added, per capital income, investment, income ratio and poverty reduction are stationary after first difference and debt service ratio is stationary after second difference based on ADF critical values of -2.6381 at 10 percent level of significance.

Table 1: ADF unit root Test Statistics

Variables	Levels	1st Difference	2nd Difference	Order of integration
DSR	0.955765	2.548792	3.290945	2
DYR	0.169558	3.504959	-	1
DOP	0.57699	3.594170	-	1
GAVA	2.47699	4.204527	-	1
GNPPC	0.433764	3.265128	-	1
INF	3.126258	-	-	0
INVYR	0.608662	3.767294	-	1
POV	0.057012	4.549105	-	1

Critical Value

1% Critical value -3.7497 5% Critical value-2.9969 10% Critical value -2.6381

1.4.1 Results of the Cointegration Tests

Having found that all the variables are integrated, the next step of our study involves the application of the Johasen cointegration procedure to ascertain whether poverty reduction. Debt-Service Ratio, Debt-Income Ratio, Degree of Openness, Growth of agricultural value added, per capital income, inflation rate, and Investment – income Ratio are co-integrated in the Nigerian context. The results of the tests are presented in table 4.2. The null hypothesisof no co-integration among the variables (i.e r=O) is tested against the alternative hypothesis of co-integration among the variables (i.e. r=1). The null hypothesis of co co-integration is rejected at the 5 percent significance level. However, the null hypothesis that r≤ 1 could not be rejected against the alternative r = 2, suggesting the presence of a unique co-integrating vector among POV, DSR, DYR, DOP, GAVA, GNPPC, INF, and INVYR.

Table 2: Johasen Cointegration Test Results

Null Hypothessi	Alternative Hypothesis	Eigen Value	Likelihood Ratio	Critical Value 5%	Critical Value 1%	Hypothesised No. of CE(S)
r=0	r=1	0.5312	46.28504	39.89	45.58	None **
r≤=1	r=2	0.4231	22.03769	24.31	29.75	At most 1
r≤=2	r=3	0.1462	7.001542	12.53	16.31	At most 2
r≤=3	r=4	0.0023	0.507172	3.84	6.51	At most 3

NOTE: *(**) denotes rejection of the null hypothesis at 5% (1%) significance level.

The table indicates that the variables are co-integrated, that is, a long-run relationship exists among the variables as indicated by the likelihood ratio that is greater than the critical values, both at the 1 percent and 5 percent levels respectively.

1.4.2 Regression Results

The regression results of the impact of debt and debt service on poverty reduction is presented in the table 4.3 below:

Table 3: OLS Regression Estimates
Dependent Variable:Pov

Explanatory Variables	Coefficients	t-Value
Intercept	1.821725	0.55912
DYR (Debt-Income Ratio)	-0.6342384	0.7834
DSR (Debt-Service Ratio)	-0.5638924	0.9342
DOP(Degree of Openness)	-0.3462982	0.5629
GAVA (Agricultural value added)	0.6348932	0.8462
GNPPC (Per Capital Income)	0.7489623	0.9348
INF (Inflation Rate)	-0.936443	0.6742
INVYR (Investment-Income Ratio)	0.548364	0.89625

R-Squared = 0.982847 Adjusted R-Squared =0.967844
F-Statistic = 196.4518 DW=2.595665

As can be seen, the explanatory powers (measured by the R^2 and adjusted R^2) of 98 and 96 percent respectively. These are reasonably high indicating that over 98 and 96 percent of the variations in poverty reduction attributable to DYR, DOP, GAVA, GNPPC, INF, INVYR and its error term given that the value of the Durbin Watson Statistic (DW) of 2.595. testing the overall significance of the regression using F-test statistic, the observed F* value of 196.45 is greater than the critical F value of 2.32 at the 5 percent level of significance. It can therefore be concluded that the overall regression equation is significant.

The results show that external debt causes poverty in Nigeria as it is indicated by the external debt variables of Debt –Income Ratio and Debt-Service Ratio that are negatively related to poverty reduction. Other variable that is also negatively related to poverty reduction is inflation rate while variables such as the degree of openness, agricultural value added, per capital income and investment – Income ratio do alleviate poverty in the Nigerian context.

1.5 Conclusion

This paper examinined the impact of debt and debt service on the poverty reduction in the Nigerian context using multivariate co-integration technique and regression analysis. The co-integration results indicate the existence of only one long-run equilibrium relationship among poverty reduction, debt-income ratio, debt-service ratio, degree of openness, agricultural value added, per capital income, inflation rate and investment-income ratio. The regression results also indicate that the debt – income ratio and debt – service ratio do cause poverty in Nigeria while the degree of openness, agricultural value added, per capital income and investment-income ratio do alleviate poverty in Nigerian context.

1.6 Policy Recommendations

Based on the conclusions of the study, the following policy recommendations are made:

1. Government should pursue vigorously, policy initiatives such as fostering per capital income growth, raising agricultural production and the pursuit of education and health sector policies that will alleviate poverty.
2. Government needs to mobilize its domestic savings efforts. This is because dependence on foreign resource for development purpose do cause poverty and it is both risky and unreliable. It is only the domestic efforts of a country that are more reliable and less risky for developmental purpose.

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