MEASURING THE EFFECTS OF DEBT VARIABLES ON POVERTY IN NIGERIA

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Abstract:
The paper investigates the effects of debt variables on poverty in Nigeria. Time series data used in the estimation covers 1980-2010.The analysis includes four variables. Poverty proxied by per capita income (PP) is the dependent variable while, external debt (DE), domestic debt (DD) and debt service payments (DS) are the independent variables. Data were sourced from various issues of the Annual Reports and Statement of Accounts, Statistical Bulletin and the Billion of the Central Bank of Nigeria (CBN). ADF-Unit Root Test is applied to check the stationarity of data. The Vector Auto-regressive (VAR) method is applied to show the relationship between poverty and debt variables. Furthermore, the Pairwise Granger Causality test proved that none of the variables granger causes each other. The result confirmed a positive but weak debt variables effect on poverty. It is recommended that government should pursue policies that will reduce the debt stock to the level where resources needed for investment will not compete with debt service payments. When enough resources are available for investment, growth will overtime increase and affect per capita income which is a prerequisite for poverty reduction.

Key words: Per capita income, External debt, Domestic debt, Debt service, Poverty, Vector Auto-regression.

Introduction
Debt and poverty remain matters of serious concern to most developing countries and international community. There are contrasting views in the literature relating to whether debt influences poverty level. Several observers have long argued that large debt burden is a major cause of poverty through its effects on economic growth and human development. The links between debt and poverty are complex, reflecting, among other things, the multidimensional aspects of poverty. The direct impact of debt on poverty is the crowding out effect of debt service payments on social spending. This is a plausible channel. Underlying the debt relief debate is the belief that fiscal resources released by the debt relief will be channeled towards social sectors thereby increasing public spending on improving the access to and quality of health, education, water, sanitation and other essential services to the poor. In this context, high levels of indebtedness, due to the attendant high debt service can directly reduce government resources that are available for the poor, for example, health and education expenditures. Also high indebtedness could lead to a decline in new flows of external resources, as a result poverty-related spending could be curtailed, in the long run. The impact of the reduction in investment in social sectors would affect poverty through income where poverty is generally defined in terms of income. However, in the short run, reducing investment in social sectors would affect directly health and education outcomes. Also high indebtedness can indirectly affect poverty by reducing the growth through the investment channel by increasing uncertainties and reducing expenditures on economic infrastructure. The rationale for raising loan by a developing country has always been to bridge the domestic resource gap in order to accelerate economic growth. Pattillo, Ricci, and Poirson (2002) attested to this when they affirmed that economic theory suggest that reasonable levels of borrowing by a developing country are likely to enhance its economic growth. With enhancement of the economic growth to at least more than

5 percent growth rate, the poverty situation in the economy is likely to be positively affected. The belief is that debt burden exacerbates poverty mainly in the indebted low–income countries by relegating poverty reduction to a lower level of priority. It is a significant obstacle to their poverty alleviation and developmental programmes. This is because in seeking to honour their debt repayment obligations many countries divert funds away from programmes aimed at reducing poverty and improving a variety of social conditions, like healthcare, education and life expectancy. This inevitably contributes to, and exacerbates the conditions of poverty afflicting many of these countries. The ways the debts are increasing whether public or external is a threatening situation of a country's economic condition. What is critically important from the viewpoint of debt analysis is that no level of debt, even a low level can be serviced without difficulties by a developing country (Friedman 1983).

Countries borrow for so many reasons. Specifically loans are used for investment purposes, human capital in terms of education, and health care services, for financing budget deficits and so on. It is then apparent that loans are used to boost economic growth and reduce poverty. But when a country's debt stock is left to accumulate, beyond a certain level serving the debt then becomes a burden and the country finds itself on the wrong side of the debt Laffer curve with debt crowding out investment and growth. The way the debts are increasing whether internal or external, is threatening Nigeria's economic condition. Nigeria however found itself trapped in this debacle of debt burden. Borrowing is not bad parse provided that the proceeds are utilized in a productive way that will facilitate the eventual servicing and liquidation of the debt. In this case borrowing need not constitute a burden if loans are optimally used and the return on investment is high enough to meet maturing obligations. The assumption was that national economies would grow overtime, and that consummate export production and reasonable trends in export prices would allow the debt service obligations arising from these projects to be met. With this, growth is likely to increase and reduce poverty. This assumption is consistent with the results from standard growth model that incorporates external debt McDonald (1982), Bardhan (1967), Hamada 1979, and Blanchard (1983). It is assumed that if this circle of growth is maintained over a period of time, per capita income may likely be affected positively which is a required condition for poverty reduction. Nigeria still remains one of the indebted nations in Africa despite the recent relief benefited by the country. This study therefore examines the connection between its debt and poverty level using some debt variables.

The plan of the work is specified as follows: section one is the introduction while section two is the literature review. Section three contains materials and method, while section four discusses results. Section five is for summary and conclusion.

Review of Literature

This section reviews past relevant works on the relationship between debt variables and poverty. A growing line of literature has dealt on the effects of debt on poverty. Contributing, Were (2001) asserts that sub-Sahara Africa (SSA) is still plagued by its heavy external debt burden compounded by massive poverty and structural weaknesses of most of the economies, which has made attainment of rapid and sustainable growth and development difficult. At another instance, Hasen (2001) analyzed the impact of aid and external debt on growth and investment from cross-country regression analysis and revealed a series of interesting relationships. He uncovers a strong evidence of positive impact of aid both on the growth rate in GDP per capital and the investment rate. Empirical analyses reporting negative effects of debt and debt service were also confirmed while a novelty in the study was the evidence of a complex interplay between the level of external debt and aid flows just as the macroeconomic effectiveness of aid is negatively related to the level of indebtedness which is more severe in highly aid dependent countries. Oxfam (1998) reported that in Tanzania experience illustrates that the effects of debt go beyond finance to impact on the lives of vulnerable households. Given the limited domestic revenues available to government in Tanzania, the claims of foreign

creditors reached alarming proportions while public sector external debt absorbs over 40% of domestic revenues.

Also according to Oxfam (1998), excessive debt servicing is not the only problem faced by the Tanzanian government but the added pressures associated with low economic growth, high population growth and aid dependence, and mismanagement. The long-terms costs associated with debt crowding out foreign investment become more difficult to quantify.

Sen (2007) comes to the same conclusion that external debt negatively affects economic growth. Impact of high debt on growth appears to operate through both a strong negative effect on physical-capital accumulation and on total factor productivity (TFP) growth.

In another study, Waheed (2006) revealed that there is a primary deficit so it has to be filled out by domestic debt. The only way to stop the process of debt accumulation is to reduce the primary deficit by continued fiscal adjustment. This adjustment should not be achieved on the cost in development expenditure rather there is need for serious efforts to increase domestic tax revenue. High and sustained rates of economic growth are essential for poverty reduction as evidenced in several studies.

Anwar (2002) concluded that if exports remain stagnant, then devaluation has directly increased foreign debt in rupee and results in dramatic increase in debt service burden, lower economic growth and higher poverty level. Study argues that it is crucial to address basic reasons that caused debt build-up and subsequent adverse effect on economic growth and poverty levels while designing a debt reduction strategy. Policy of tax reforms, expanding the production base and export base and creating diversification in exports can be handy in tackling debt problem.

Asogwa (2005) pinpoints that Nigeria is not the only country faced with this escalating level of government indebtedness, but when compared with other sub-Saharan region, that of Nigeria was seen to be larger than the others by the years.

Fajana (1993) in his opinion sees nothing wrong with external debt but that the debt crisis emanates from mismanagement of such funds. To him, borrowing is desirable and also unavoidable because external borrowing is a first order condition for bridging the domestic gap; while the second order is that such funds should be invested in viable project whose rate of return is higher than that of the interest rate on the loan. Put together, he concluded by saying that for external debt to serve as an engine of growth it has to be properly managed and the resources it makes need to be prudently and efficiently utilized.

Ogwuma (1996) is of the view that debts arise from loans and credit procured by the residents of a country from the rest of the world that is meant for bridging the gap between saving and investment. He stipulated that when these resources are productively deployed and utilized, they do not constitute any drain on the future resources. He further buttressed that, to ensure sustainability of debt servicing, borrowing countries like Nigeria need to adopt efficient external debt management strategies, which entail carefully planned schedules of external debt acquisition, deployment and retirement.

In fact, many empirical findings have proved that, debt burden depresses the economic growth of the country because it affects many of the debt variables directly or indirectly via investment. Investment behaviour is adversely affected by debt serving. A study by the IMF (1989.65 on investment behaviour indicated that the level of investment was very low in heavily indebted countries. Poor investment is highly correlated with the debt overhang. The debt burden depresses investment and consequently economic growth itself with a resultant negative effect on poverty. Concurring, Stiglitz (2000; 790) affirmed 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.

Materials and Methods
Sources of data
The objective of this study is basically to examine the impact of debt variables on poverty in Nigeria. The time series data used in the estimation covers 1980-2010.The annual data which consist of secondary data were sourced from various issues of the Annual Reports and Statement of Accounts, Statistical Bulletin and the Billion of the Central Bank of Nigeria (CBN).Poverty is proxied by per capita income (PP), and the debt variables are external debt (DE), domestic debt (DD) and debt service payments (DS).

Model specification and estimations:
      The study uses a Vector Auto regression model to investigate the impact of debt variables on poverty with per capita income as the dependent variable to capture the poverty situation. Thus the model expresses poverty as a function of external debt, domestic debt and debt service as:

$$PP = (DE, DD, DS) \qquad\qquad (1)$$

The empirical equation is given as:
$$PP = \beta_0 + \beta_1 DE + \beta_2 DD + \beta_3 + \varepsilon_t \qquad\qquad (2)$$
Where
PP = Poverty proxied by per capita income
DE = external debt
DD= domestic debt
DS = debt service

Before the regression analysis, a stationary test on the variables was performed. Economic theory requires that variables be stationary before the application of standard econometric techniques. This is to avoid spurious results. The result of the stationary test is presented below. The stationary texts show that all the variables are stationary at first difference.

Table 1.ADF-Fuller (Stationary) test

Variable	ADF-statistic	Critical value	Decision rule
PP	-4.50709 (0.0000)	1% =-3.689194 5% =-2.971853 10%=-2.625121	Stationary at 1st Difference
DE	6.609101 (0.0000)	1% = -3.689194 5% = -2.971853 10%=-2.625121	Stationary at ^{1st} Difference
DD	-3.362430 (0.0024)	1% =-3.689194 5% =-2.971853 10%=-2.625121	Stationary at 1st Difference
DS	5.455496 (0.0000)	1% =-3.689194 5% =-2.9711853 10%=-2.625121	Stationary at 1st Difference

Source: Own computation

With the stationary test completed, the study performed the Granger-causality test on the variables. The decision rule requires that for a high F-statistic value and a low probability value we reject the null hypothesis and accept the alternative .The result of the causality test is tabulated below.

Pairwise Granger Causality Tests   Table 2
Date: 06/14/12   Time: 01:17
Sample: 1980 2009
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
DE does not Granger Cause PP	28	1.72128	0.2011
PP does not Granger Cause DE		0.03987	0.9610
DD does not Granger Cause PP	28	0.28234	0.7566
PP does not Granger Cause DD		0.49723	0.6146
DS does not Granger Cause PP	28	1.04787	0.3668
PP does not Granger Cause DS		0.29213	0.7494
DD does not Granger Cause DE	28	0.22235	0.8023
DE does not Granger Cause DD		0.21031	0.8119
DS does not Granger Cause DE	28	0.12000	0.8875
DE does not Granger Cause DS		2.08674	0.1470
DS does not Granger Cause DD	28	0.56013	0.5787
DD does not Granger Cause DS		1.47946	0.2486

As documented above the results reported that none of the variables granger causes each other because of the low F-statistics and high probability value. Hence the study accepted the null hypothesis. The fact that none of the variables granger-causes each other, does not necessary imply that they are independent of one another. Granger-causality only refers to the capacity of independent variables to forecast the dependent one.

Finally the quantitative effects of external debt, domestic debt and debt service on poverty in Nigeria are estimated using the vector auto-regression (VAR) approach. The result of the estimation is presented below:

PP= 1224.81 - 0.8634PP (-1) + 4.12E-05DE - 5.20E-06DD+6.28E-05DS   (3)
S.E.   (375.531)   (0.1725)   (2.5E-05)   (1.2E-05)   (4.4E-05)
t   [3.261]   [5.003]   [1.6472]   [-0.4425]   [1.4304]
R^2=0.736   F = 12.311

Table 3
Vector Auto regression Estimates
Date: 02/27/12   Time: 02:01
Sample (adjusted): 1982 2009
Included observations: 28 after
    Adjustments
Standard errors in ( ) & t-statistics
in [ ]

	PP
PP(-1)	0.863488
	(0.17259)
	[5.00300]
PP(-2)	-0.320721
	(0.14400)
	[-2.22719]
C	1224.809
	(375.531)
	[3.26154]
DE	4.12E-05
	(2.5E-05)
	[1.64727]
DD	-5.20E-06
	(1.2E-05)
	[-0.44250]
DS	6.28E-05
	(4.4E-05)
	[1.43047]
R-squared	0.736706
Adj. R-squared	0.676866
Sum sq. resids	163753.5
S.E. equation	86.27480
F-statistic	12.31134
Log likelihood	-161.1651
Akaike AIC	11.94036
Schwarz SC	12.22583
Mean dependent	2755.948
S.D. dependent	151.7724

Discussion of Results

The study estimates the effects of external debt, domestic debt, and debt service payments on poverty using VAR approach. The results of the estimation show that the explanatory variables account for approximately 73.6 percent of variation in poverty level in Nigeria. The estimation result in equation (3) indicates that external debt and debt service are positively significant. For instance, a 1 percent increase in external debt and debt service raises poverty level by approximately 4.12E-05 and 6.28E-05 respectively. The estimation further revealed that domestic debt is statistically significant but its coefficient is negatively signed indicating that an increase in domestic debt reduces the poverty level; for instance a 1 percent increase in domestic debt leads to approximately 5.20E-06 percentage decrease in poverty level. This result is not in conformity with a

prior expectation because many researchers have proved that debt whether external or domestic leads to an increase in poverty level when resources required for investment are diverted for repayment of debt Hasen, 2001. It is worth emphasizing that all the variables exhibited a very weak relationship with poverty level judging by the value of their coefficients. Finally, it is shown that the lagged value of per capita income-the variable for poverty, has a significant negative influence on current per capita income. A 1 percent increase in per capita income in the previous year leads to a decrease in the per capita income in the current year by approximately 0.86 percent.

Summary and Conclusion
The main focus of the study is to highlight the effects of debt variables on poverty in the country. The estimation results of the VAR model resulted to the conclusion that external debt and debt service have positive impact on poverty, but domestic debt was found to have negative effect on poverty. Moreover the relationship between the variables and poverty was weak. One would have expected to see a very strong relationship as reported by many studies. Some policy implication can be drawn from the findings. The implication is that the debt stock with its huge service payments increases poverty level by reducing the resources needed for investment and growth. The belief is that debt burden exacerbates poverty mainly in the indebted low-income countries by relegating poverty reduction to a lower level of priority. It is a significant obstacle to their poverty alleviation and developmental programmes. This is because in seeking to honour their debt repayment obligations, many countries divert funds away from   programmes aimed at reducing poverty and improving a variety of social conditions, like healthcare, education and life expectancy. This inevitably contributes to, and exacerbates the conditions of poverty afflicting many of these countries. It is a known fact that where growth is maintained for a period of time, per capita income which is a prerequisite for poverty reduction will be positively affected. The government is therefore advised to pursue policies that will aid the reduction of debt in the country. This will enhance economic growth with a resultant improvement in poverty.

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