THE NEXUS BETWEEN DEBT FACTORS AND ECONOMIC DEVELOPMENT IN SUB-SAHARAN AFRICAN COUNTRIES.

Owoputi James Ayodele (Correspondent)* Kehinde Asamu Job-Olatunji* Emmanuel Chukwuemeka, Ejianya**

* Rufus Giwa Polytechnic, Owo Email: ayoowoputi@yahoo.com Tel: 0803357850

**D. S Adegbenro ICT Polytechnic, Itori, Ogun State.

Email: kehindejobolatunji@gmail.com, Tel: 08033190790

***Caleb University Imota, Lagos State, Email: emmaejianya04@yahoo.com

Abstract

The study is an attempt to investigate the causal influence running from debt factors to economic development in sub-Saharan African countries. The study employed quantitative research design. A random technique was adopted to select the countries with sufficient observations that will cover the scope of this study. Panel data estimation technique was adopted because it takes care of heterogeneity associated with individual countries by allowing for individual specific variables. The dependent variable for this work is economic development and it is proxy by GDP per capita/income per head. And the independent variables are external debt, total of debt service on external debt and long-term external debt stocks. Data on these variables are collected from the World Bank Indicator for a period of 35 years which spans from 1985 to 2019. The data were de-trend by taking the log form. Mean group and pooled mean group models are employed to analyze the hypotheses of this study. The study concluded that in the long run external debt, total of debt service on external debt and long-term external debt stocks have a negative influence on economic development in sub-Saharan African countries. It is recommended that any projects that the government want to finance with external borrowing should be properly appraised, technically and financially viable before the government will embark on such project. This will enhance the proper management of the borrowed funds.

1. Introduction

External and internal debts are seen as two edge swords, it has both positive and negative effect on a country's economic development. Debt factors can have adverse influence on the economy of a country if the funds generated from it are not put into optimum productive activities. If caution is taken to prevent going over the acceptable limitations, borrowing is an important tool the government utilizes to finance developmental projects that encourage economic expansion. Any loan, whether domestic or international, that exceeds an acceptable threshold may be considered economically unsound. Over the years, lot of scholars have researched into the real effect of debt factors on economic development. Researchers like Haffiner et al., 2017; Igbodika et al., 2016; Mbata, 2014; Ari & Koc, 2018; Ayuba & Khan (2019); Saungweme & Odhiambo, (2020). These authors used different debt factors to carry out investigation whether any of the debt factors used have significant effect on economic development and sustainability or not. Schclarek (2004) examined the relationship between debt and economic development between 1970 and 2002 using data from 59 developing and 24 developed nations. According to the study, there is no proof that there is a connection between total factor productivity and foreign debt. The research with developed countries, however, demonstrates that there is no evidence to support a relationship

between public debt and economic performance, despite the study's finding that there is a negative correlation between public debt and economic production in developing countries.

Elbadawi, Ndulu, and Ndungu (1997) examined the effect of debt overhang on economic growth using data from 99 developing nations in Asia, sub-Saharan Africa, the Middle East, and Latin America. They came to the conclusion that external debt has a bad impact on economic growth because it accumulates past a certain point and causes a debt overhang and outflows to pay obligations. There is an inverse association between external debt and economic development, as was confirmed by other studies like those by Zouhaier and Fatma (2014) and Senadza et al. (2017). However, according to Pattillo et al. (2011), an acceptable debt level has a positive effect on economic growth. It is clearly seen that there are various conclusions regarding the actual effect of debt factors on economic development, thus, this present study investigated the nexus between debt factors and economic development in sub-Saharan African countries.

Literature Review

2.1Theoretical Review

The Classicals and the Keynesians Theories.

Due to the investments opportunities that debt can produce, public sector borrowing does not place a burden on the proponents of Keynesian interventionism, either for present-day or future generations (Prasetyo, 2020). According to the Keynesian and neoclassical theories of optimum policy, nations should run deficits and amass debt in difficult times and surpluses in prosperous ones. In the event that growth shocks persist, countercyclical scale policy will result in a long-term negative correlation between public debt and growth, where low growth leads to high debt rather than the other way around (Akos & Istvan, 2019). However, according to classical economists, public debt is a burden that could endanger capital formation and present and future consumption. Also, higher amounts of public debt are expected to have worse impacts because economic players anticipate future confiscations, which could boost inflation or skew taxation, for example (Cochrane 2011a; 2011b).

2.2 Empirical Review

The ARDL method was used by Saungweme and Odhiambo (2020) to assess the effects of domestic and foreign indebtedness on Zimbabwe's economic growth from 1970 to 2017. The study revealed empirical evidence that Zimbabwe's economic growth was significantly hampered by both domestic and international debt. Using the ARDL model, Haffiner et al. (2017) evaluated the effect of domestic debt on Sierra Leone's economic development from 1970 to 2015. The findings showed that domestic debt has both short- and long-term negative effects on economic growth.

The actual consequences of government borrowing on Malaysia's economic growth were studied by Burhanudin et al. in 2017. The data, which covered the years 1970 to 2015, was analyzed using the Autoregressive Distributed Lag method. The study discovered significant and favorable short- and long-term connections between the variables. The outcome suggested that Malaysian government borrowing supports ongoing economic growth.

For the period 1988–2004, Jayaraman and Lau (2009) used data from six countries on the Pacific Island to examine how foreign debt affected economic performance. They found evidence for cointegration in that analysis, as well as a strong and statistically significant relationship between foreign debt and economic growth.

Geiger (1990) who employed a dataset from South American countries to examine the influence of external debt on economic performance in Latin American countries from 1974 to 1986. The study, which used the lag distributed model, found evidence to show that foreign debt has a statistically significant inverse connection with economic output.

Putunoi and Mutuku (2013) examined the effect of domestic debt on Kenya's economic growth from 2000 to 2010 using cointegration tests based on Engel-Granger residuals and Johannes VARs, and they found that domestic debt markets are becoming a more significant factor in promoting economic growth. They discover that an increase in domestic debt has a positive, long-lasting, and considerable impact on economic growth.

Pattillo et al. (2011) investigated the relationship between debt and growth from 1969 to 1998 using data from 93 developing nations in Latin America, Sub-Saharan Africa, and the Middle East. OLS, instrumental variables, fixed effects, and system Generalized Method of Moments (GMM) were used in the study as techniques to demonstrate the relationship between the variables. The researchers came to the conclusion that an ideal debt level has a favorable effect on growth. However, the researchers went further to demonstrate that additional borrowing might harm growth if it exceeds the optimum debt levels.

3. Method

In this section the methodological framework for the study is presented in a unique and distinct way, which involves transforming the variables of interest by demeaning to eliminate heterogeneity or endogeneity that associates with fixed effects model.

3.1. Nature and Source of Data

The countries used in this study are about 6 sub-Saharan African countries (Nigeria, South-Africa, Ghana, Angola, Namibia and Algeria). Random sampling technique was used to select these six countries due to the fact all the countries have equal chance of being selected. Also, preference was given to countries that have enough data to cover the time frame of the study. The study period is for 35 years from 1985 to 2019, in which consistent data span are available. The data were collected from the World Bank Indicator. Data on external debt, income per head, total of debt service on external debt and long-term external debt stocks were collected for 35 years.

3.2. Model Specification

The researcher adopted an expanded specification for this study, the model is presented below.

$$iph = f(exd, tds, lted) \qquad 3.1$$

$$iph_{it} = \alpha + b_1 exd_{it} + b_2 tds_{it} + b_3 lted_{it} + u_{it} \quad 3.2$$

$$y_{it} = \lambda_0 + \sum_{j=0}^{k} \lambda_j x_{jit} + u_i + w_{it} \quad 3.3$$

$: j = 1, 2, ..., k$

Where k is 3

$$\sum_{j=1}^{3} \lambda_j x_{jit} = \lambda_1 x_{1it} + \lambda_2 x_{2it} + \lambda_3 x_{3it} \quad 3.4$$

$$g_{it} = \alpha_0 + \sum_{j=0}^{k} \alpha_j x_{jit} + e_i + v_{it} \quad 3.5$$

$: j = 1, 2, ..., k$

In this case k is 3

$$\sum_{j=1}^{3} \alpha_j x_{jit} = \alpha_1 x_{1it} + \alpha_2 x_{2it} + \alpha_3 x_{3it} \quad 3.6$$

3.3 Definition of Variable

Where: y in equation 3.3 represents income per head as a proxy for economic development.

g in equation 3.5 represents income per head growth rate. y and g are the dependent or explained variables.

x_1, x_2 and x_3 are the independent or explanatory variables for equation 3.4 and 3.6 and they are external debt, total of debt service on external debt and long-term external debt stocks respectively.

α and λ are the parameter of the equations.

u and w in equation 3.3 represent the specific/individual error and common error respectively.

e and v in equation 3.5 represents the specific and common error respectively.

3.4. Estimation Technique

In analysing the nexus between external borrowing factors and economic development in sub-Saharan Africa countries, mean group and pooled mean group estimation techniques are employed. The analysis was conducted using Stata 16 statistical tool.

4. Results

4.1. Descriptive Statistic

Results table 4.1 below indicate the descriptive statistics of income per head, income per head growth rate, external debt, total of debt service on external debt and long-term external debt stocks.

Table 4.1: Descriptive Statistics

	INCPH	GRINCPH	EXTDEB	EXTDEBSER	EXTDEBTLT
Mean	1060.812	0.033973	8.51E+09	6.21E+08	7.57E+09
Median	453.2287	0.040650	3.68E+09	1.43E+08	3.19E+09
Maximum	5904.256	0.810028	5.48E+10	8.81E+09	5.25E+10
Minimum	103.2811	-1.000000	3.46E+08	25903059	3.44E+08
Std. Dev.	1309.667	0.212277	1.13E+10	1.18E+09	1.04E+10
Skewness	2.163421	-1.262274	1.854017	3.645938	1.978430
Kurtosis	7.142612	9.923820	5.589320	19.32226	6.247680
Jarque-Bera	313.9745	475.2355	178.9733	2796.392	229.2865
Probability	0.000000	0.000000	0.000000	0.000000	0.000000
Observations	210	210	210	210	210

Source: Author 2021

The table above shows the descriptive property of the variables employed for this study. these variables are INCPH (income per head), GRINCPH (income per head growth rate), EXTDEB (external debt), EXTDEBSER (total of debt service on external debt) and EXTDEBTLT (long-term external debt stocks). The mean value of income per head, income per head growth rate, external debt, total of debt service on external debt and long-term external debt stocks are approximately 1060.81, 0.03, 8.51E+09, 6.21E+08 and 7.57E+09 respectively. The values are all positive average values. Income per head, external debt, total of debt service on external debt and long-term external debt stocks are positively skewed except for income per head growth rate which is negatively skewed. The kurtosis values of all the variables are above 3 meaning they are leptokurtic in nature that is in the future these variables would manifest high values. The probability values for the entire variables are zeros. This is an indication that the series of the variables do not follow a normal distribution pattern.

4.2. Test of Hypotheses

For insights into the association between the dependent variable and independent variables focus was on the inferential statistics analysis which was conducted to see the existence and nature of the relationship between the explained variables and the explanatory variables. Therefore, this section is organized as per the domains of economic development involved in each objective and hypothesis. These hypotheses are one there is no strong relationship between economic development and external debt, two the nature of the relationship between total of debt service on external debt and economic development is not significant. Lastly, long-term external debt stock does not have a positive and significant impact on economic development.

Table 4.2: Mean Group Estimation Results of hypotheses testing using Income per Head as the Dependent Variable

Variable	Coef.	Std. Err.	Z-value	P-value
logextdeb	0.5916434	0.6012699	0.98	0.325
logextdebser	0.0934336	0.0372386	2.51	0.012
logextdebtlt	-0.7813943	0.5298236	-1.47	0.140
000007_t	0.0474541	0.0078396	6.05	0.000
cons	8.106408	3.606999	2.25	0.025

Source: Stata 16 Software

In the table above the result of the test conducted using mean group model is presented. The dependent variable is income per head while the independent variables are external debt, total debt service on external debt and long-term external debt stocks. It is discovered that external debt and total of debt service on external debt have positive impact on income per head. This indicates that if debt funds are used appropriately, it will increase the wellbeing of citizens. The relationship between income per head

as an indicator of economic development and total of debt service on external debt is significant at 5 percent alpha value. The long-term external debt stocks is negatively related to income per head. However, the relationship is insignificant. The next table shows the fitness of the model employed here.

Table 4.3: Test for Model Fitness

Statistics	Coeff	P-value
Wald test	8.75	0.0329
Root Mean Squared Error (sigma)	0.2307	

Source: Stata 16 output

As shown in table 4.3 the output of the model fitness test. Two statistics are used here which are the Wald test and Root Mean Squared Error. The coefficient of the Wald test is 8.75 and the associated probability value is approximately 0.03. The probability value of the Wald test is lesser than 5 percent. This implies that the null hypothesis that the explanatory variables are not significantly different from zero is rejected. The Root Mean Squared Error value is closer to zero, thus, the closer the value to zero the better the model.

Table 4.4: Pooled Mean Group Estimation Results of hypotheses testing using Income per Head as the Dependent Variable

Variable	Coef.	Std. Err.	Z-value	P-value
Long Run				
logextdeb	3.086145	0.5900443	5.23	0.000
logextdebser	-0.011881	0.1336681	-0.09	0.929
logextdebtlt	-3.018587	0.6535575	-4.62	0.000
Short Run				

ecm (-1)	-0.1146661	0.0603156	-1.90	0.057
logextdeb	-0.198558	0.0610291	-3.25	0.001
logextdebser	0.002146	0.0210347	0.10	0.919
logextdebtlt	0.1311982	0.0942526	1.39	0.164
cons	0.6157203	0.3102294	1.98	0.047

Source: Stata 16 output

The Pooled Mean Group results reported above is used to verify the results of the Mean Group in table 4.2. still using income per head as the dependent variable. The independent variables still remain the same, they are log of external debt, total of debt service on external debt and long-term external debt stocks. The Pooled Mean Group results show both the short and long run impact of the independent variables on the dependent variable and the error correction mechanism. In the long run, it is discovered that external debt and long-term external debt stocks are significantly related to income per head. Therefore, external debt and long-term external debt stocks have significant influence on economic development in the long run. The relationship among total of debt service on external debt, long-term external debt stocks and economic development is negative in the long run. Meaning as the government incurred more and more debt there will be decrease in economic development. The error correction mechanism is negative and significant at 10 percent; this implies that any disequilibrium in the system can easily be corrected in the long run. In the short run log of external debt has an inverse and

significant effect on economic development. While, total of debt service on external debt and long-term external debt stocks have positive and insignificant impact on income per head.

Table 4.5: Mean Group Estimation Results of hypotheses testing using Income per head growth rate as the Dependent Variable

Variable	Coef.	Std. Err.	Z-value	P-value
logextdeb	0.2131048	0.2912677	0.73	0.464
logextdebser	-0.07601	0.0364336	-2.09	0.037
logextdebtlt	-0.2668774	0.2985034	-0.89	0.371
000007_t	-0.0016507	0.0034203	-0.48	0.629
cons	2.720821	0.304282	8.94	0.000

Source: Stata 16 Software

Table 4.5 shows the results of the mean group using income per head growth rate as the explanatory variable. The coefficient of log of external debt, log of total of debt service on external debt and log of long-term external debt stocks are approximately 0.21, -0.08 and -0.27 with probability value of 0.46, 0.04 and 0.37 respectively. It is seen that external debt has a positive and insignificant influence on income per head growth rate. The log of total of debt service on external debt and log of long-term external debt stocks are negative determinants of economic development. However, only log of total debt service on external debt has significant impact on economic development.

Table 4.6: Test for Model Fitness

Statistics	Coeff	P-value

Wald test	72.20	0.0000
Root Mean Squared Error (sigma)	0.1949	

Source: Stata 16 output

The result of the model fitness on the model relating to income per head growth rate and debt factors is reported in table 4.6 above. Wald test and Root Mean Squared Error results are presented. The probability value of the Wald test is zero, this implies that the null hypotheses that the independent variables are not significantly different from zero is refuted. Therefore, the independent variables are able to explain the dependent variable. The Root Mean Squared Error value is close to zero meaning the model adopted for this study is good.

Table 4.7: Pooled Mean Group Estimation Results of hypotheses testing using Income per head growth rate as the Dependent Variable

Variable	Coef.	Std. Err.	Z-value	P-value
Long Run				
logextdeb	-0.0757995	0.1497694	-0.51	0.613
logextdebser	-0.05955	0.0290491	-2.05	0.040
logextdebtlt	-0.0123772	0.1453614	-0.09	0.932
Short Run				
ECMS (-1)	-1.02664	0.126561	-8.11	0.000
logextdeb	0.2144606	0.2765959	0.78	0.438
logextdebser	0.0517433	0.0373301	1.39	0.166
logextdebtlt	-0.1416595	0.2655776	-0.53	0.594
cons	3.179956	0.3756691	8.46	0.000

Source: Stata 16 output

The mean group result in table 4.5 above is verified using Pooled Mean Group. The Pooled Mean Group result shows the short run and long run influence of the debt factors on economic development. In the short run log of external debt and log of total of debt service on external debt have positive impact on income per head growth rate but log of long-term external debt stocks has a negative effect on income per head growth rate. The ECM parameter is negative and significant that is the speed of adjustment is stable. The show that in the long run all the debt factors employed in this study negatively relate to economic development. Nevertheless, only log of total of debt service on external debt is significantly related to economic development, this is the same with the result of Mean Group.

4.3 Discussion and Implication of Findings

In this study, the researchers documented that there is a negative relationship between external debt and economic development. This is in consonant with the findings of Geiger (1990). Thus, there is substantial evidence that increase in external debt is capable to reduce economic development. Furthermore, we established that foreign debt has inverse impact on economic

output. Similarly, the study of Clements, Bhattacharya and Nguyen (2004) confirmed this negative relationship. Elbadawi, Ndulu and Ndungu (1997), Zouhaier and Fatma (2014) and Senadza et al. (2017) concluded that external debt has a negative relationship with economic growth. The implication of this finding, which is in tandem with existing position, is that a rise in either debt service or debt repayment/amortization creates direct externality that significantly reduces economic growth/development.

5. Conclusion

Based on the major findings the following conclusions are presented as follows: The study concluded that in the long run external debt has a negative influence on economic development in sub-Saharan African countries. Additionally, it is concluded that the nature of relationship that exist between total of debt service on external debt and economic development is negative and significant. Long-term external debt stock has a negative coefficient value, it is therefore concluded that long-term external debt stocks and economic development are negatively and insignificantly associated. In view of the conclusions given above, the following policies recommendations are proposed to be adopted by the government of the selected countries. They are as follows: It is recommended that any projects that the government want to finance with external borrowing should be properly appraised, technically and financially viable before the government will embark on such project. This will enhance the proper management of the borrowed funds. Servicing external debt requests more resources, that is to say more funds would be needed to service and repay the debt. it is thus recommended that government should invest the borrowed fund on production activities and not on recurrent activities. Finally, it is recommended that the government should analyzed the positive and negative effect debt before borrowing. Since there are stringent conditions attach to some loans. Therefore, the government should not borrow funds that will affect the economic welfare of its citizens.

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