



Public Debt and Incidence of Poverty in Sub-Saharan Africa: The role of Institutional Quality

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Abstract

The continuous accumulation of public debt and ever increasing incidence of poverty in Sub-Saharan African (SSA) has been investigated by various researchers. This study aims at investigating the role of institutional quality in the public debt, incidence of poverty relationship. Using the Generalized Method of Moment (GMM) approach on a sample of 42 SSA countries, the link between public debt and incidence of poverty was examined over the period 2011 to 2019. The findings of this study revealed that the relationship between the public debt and Household Final Consumption Expenditure Per capital is negative, and this shows that public debt accumulation is one of the leading causes of poverty in SSA. However, the result of the interaction term of public debt and institutional quality confirms that this negative relationship can be averted or even reversed if the quality of the institutions improves in the region. This indicates that, while public debt accumulation aggravates the incidence of poverty, such an appalling trend can be reverted or even prevented. The study therefore, recommends the need for governments to take a determined stand of not only minimizing public debt accumulation but also ensuring comprehensive improvement of institutional qualities to alleviate the incidence of poverty in SSA.

Keywords: Public Debt, Poverty, Institutional quality, Sub-Saharan Africa.

1. Introduction

To eradicate the incidence of poverty in developing countries, United Nation sets the 2030 new target for the menace to be subdued to a bearable level but the trend in sub-Saharan African (SSA) countries looks like a mirage. Several policy initiatives have been implemented by successive governments in SSA, with the futile result (Le Goff & Singh, 2014; Okonjo-Iweala et al., 2003). Although a remarkable achievement in reducing the extreme poverty has been recorded across the world, this region has been an exception. SSA is the only region where the percentage of poor has not been reducing significantly over the years (World Bank, 2014). Presently, the poor people of SSA are said to be worse off when compared with their counterparts in other regions (Bicaba et al., 2015). This region is found to have lagged far behind other regions in terms of the satisfaction of the necessities of life as revealed by the lower level of household final consumption expenditure per head over the years (Appendix A). This poses the challenge of answering why is SSA the poorest region, why alleviation of poverty in this region defy all conventional approaches, and what can be done to reverse the worrisome trend.

To stimulate economic growth and development and put smile on the faces of the citizenry, successive governments in SSA adopted public debt policy since the attainment of their political independence. However, empirical evidences confirm that the years of public debt accumulation has only failed this region, as meaningful sustainable economic growth have been (Fosu, 1996; Megersa, 2014; Milton, 1999; Sani et al., 2019). This shows that, rather than stimulate economic growth and trickle down the benefits to downtrodden masses, public debt increases monumentally to unsustainable level in SSA countries until most of them become insolvent. This region has over the years continue to record growing fiscal deficits characterized by macroeconomic instability, decelerated investment, and poor economic growth.

The approval of the multilateral debt relief initiatives for over 33 countries of SSA, more recent reports indicate that public debt accumulation of SSA rose monumentally to over six hundred billion dollars by the year 2019 (World Bank, 2019). Concerns over the determinants of poverty in SSA have been documented, however, research exploring the relationship between public debt and the incidence of poverty on SSA is scarcely explored. However, it haven documented that most indebted countries are usually forced to adopt certain austerity measures (Milton, 1999; Olumide, 2016). These measures that are targeted toward the reduction of government expenditure on education, health care and other social services is expected to have subjected the masses into untold hardship, reduce their standard of living and plunged them into extreme poverty.

Moreover, the new wave of research confirm that institutional quality play a pivotal role in mediating the impact of public debt on the economic growth of a nation (Daud & Podivinsky, 2014; Kim et al., 2017). This suggests that countries embedded with good institutions efficiently utilize public debt to stimulate growth. On the other hand, apart from destabilizing the borrowing decisions of a nation, or diverting the borrowed funds to white elephant projects, poor institutional qualities tend to trigger high propensity to borrow. This potentially increases the likelihood of debt defaulting or heightens the desire to accumulate public debt in the country (Tarek & Ahmed, 2017).

Besides, the difficulty of measuring the multidimensional nature of the incidence of poverty have limited the research focus on the determinant of poverty in developing countries. While income per capita, Gini coefficient and Poverty headcount index have been the most popular proxies, these are not, however, without limitations (Woolard & Leibbrandt, 1999). This is because they cannot account for or capture the different dimensions of poverty in developing countries like SSA. Moreover, data from World Bank on the poverty line and poverty headcount index measured in

US Dollar at \$1.25 and recently \$1.90 are only available for very few countries and years. Consequently, this paper used Household Final Consumption Expenditure per capita to measure the incidence of poverty in SSA. This proxy has been found to be more stable and reliable measure of poverty than the income approach (Ndikumana, L., & Boyce, 2011; S. A. Odhiambo, 2014). Likewise, the used of this variable tallies with the definition of poverty given by World Bank “ as the inability to attain a minimal standard of living” measured by the household consumption needs (World Bank, 1990).

Additionally, the noticeable differences in methodological approaches, geographical locations, period covered by existing studies have necessitated the need for panel study. This is particularly relevant on SSA that has about 48 countries sharing approximately the same characteristics in terms of the attainment of political independence, debt accumulations, extreme poverty and quality of institutions. Also, the generalized method of moments (GMM) approach was found to be suitable because of the following reasons. Firstly, the number of a panel of countries (N) is greater than the time length (T), ($N > T$). Secondly, unlike cross-sectional data, it controls the heterogeneity problem. Thirdly, biases from aggregation over firms or individuals can be minimized or even abolished. Fourthly, unlike cross-sectional data, the dynamic of adjustment can be modelled. Lastly, panel analysis has more informative data, more variability, less collinearity, more degrees of freedom and is more efficient.

Following the above, the remaining parts of this paper are structured as follows. Section 2 reviews the literature on public debt and poverty nexus. Section 3 gives a highlight of the methodological

approach employed in data analysis. Section 4 is the discussion of the estimated results, and finally, section 5 is summarized, concludes and suggested the policy implications.

Review of existing Literature

The theoretical literature has not been clear regarding the direct transmission mechanisms through which public debt aggravates the incidence of poverty. However, the debt crowding-out effect of government spending on social sector can be seen as the direct means, and that the harmful effect of public debt on economic growth through the debt overhang, on the other hand, can be seen as the indirect means as explained below. This strand of literature tried to show that the relationship between public debt and economic growth of a nation is negative and consequently, aggravate the incidence of poverty. Firstly, the debt overhang hypothesis has been the dominant hypothesis regarding the harmful effects of public debt accumulation in a country. Debt overhang refers to the situation when the level of debt in a country is so large to the extent that it can no longer take additional debt to finance its future projects. Debt overhang tends to discourage current investment, as all the benefits of new investment go to the creditors, leaving little or no incentive for a country to jump out of the hole. Debt overhang usually occurs when the level of indebtedness in a country exceeds her ability to pay. This is particularly harmful to poor nations because they will be caught in a vicious cycle of indebtedness and therefore fall short of funds required to procure their essential needs. Krugman, (1988) and Sachs, (1989) described debt overhang as a situation in which the large stock of debt raises the expectations of the investors on the imposition of heavy distortionary taxes to service the debt. This future anticipation discourages domestic and foreign investment, which consequently slows down the rate of economic growth. Clements et al., (2003), argue that to meet up with fiscal obligations the debt overhang hypothesis leads to uncertainty in government policies, which the prospective investors usually wait and study the action taken by

the government concerning debt servicing. This leads to the concentration of the investment on a short-term basis that guarantees a quick return, rather than the uncertain long-term investment required for long-term economic growth.

Secondly, the debt crowding-out effect is another line of argument based on the belief that public debt affects the economic growth of a nation negatively. This hypothesis assumes that heavy debt burden drains the national resources required for government expenditures in both physical and human capital, and thus negatively affects economic growth. This particularly happens due to the excessive charging of interest which deteriorates the terms of trade of the indebted country (Friedman, 1978; Krugman, 1988). In line with this argument, Patenio & Augustina, (2007) argue that the debt crowding out effect weakens the capability of a nation to maintain a sustainable level of debt; therefore leaving very little resources for investment while struggling to meet its debt servicing obligations. Similarly, Gupta, Clements, Gupta et al., (2006) argue that when debt servicing continues to grow, foreign investors gradually take away their capital from the economy, and this scares away and discourages foreign investments. Metwally & Tamaschke, (1994) argue that debt servicing takes away capital from national to the international arena, in which as a consequence, certain dramatic multiplier-accelerator effects will be generated, which reduce the capability of the economy to grow and thus increase its reliance on external debts. This idea assume that public debts consume a considerable percentage of the national savings due to excess demand for savings while supply remains unchanged, and therefore raise the rates of interest. This creates a situation in which only governments can afford to borrow because of the excessive rate of interest. Consequently, private firms become incapable of competing with the government, thus crowding out private investment, which negatively affects economic growth.

Lastly, the vicious circle of poverty proposed by Nurkse, (1953). He explains how less developed countries continue to be poor due to lower-income level, lower domestic savings, and lower consumption level. These factors interrelate to form a circle that perpetuate the incidence of poverty. According to this theory, it is poverty that further begets poverty, traps people in extreme poverty, and negates any possibility to break the circle. Therefore, the lower level of income, low domestic savings, and low consumptions have forced the countries in SSA to accumulate public debt to supplement their domestic savings. However, the accumulated debt is grossly underutilized and their debt burden becomes burdensome on government spending on social sectors (Sani et al., 2019). Besides, the Structural Adjustment Measures (SAP) imposed on indebted country to streamline its economy toward the debt servicing usually forced the country to decrease their public expenditure on important sectors like education, health and developmental project (Shah, 2013). This happened in the 1980s and 90s when many countries in SSA were requested to cut down government expenditure which eventually reduced consumption level and standard of living and aggravated the incidence of poverty in the region.

Empirical literature on the relationship between public debt and poverty has been plentiful particularly in developing countries. For example, Oyedele et al., (2013) used the cointegration and regression approach to study the external debt and poverty relationship in Nigeria from 1980 to 2010. The result confirms that debt service burden aggravates the incidence of poverty in Nigeria. Similarly, the Ordinary Least Square (OLS) technique, Granger Causality Approaches and Vector Autoregression (VAR) were used by Ngerebo (2014) to ascertain the link that exists between domestic debt and the level of poverty in Nigeria from 1986 to 2012. The result of this study confirms the presence of a long-run relationship between the domestic debt and the incidence of poverty in Nigeria. Also, Okon (2017) employed a multivariate regression technic on time series data of 1986 to 2016 to investigate the relationship between public external debt, economic growth and level of poverty in Nigeria. The findings of the study show that public debt has a statistically

significant positive impact on the level of poverty. Similarly, Saungweme & Mufandaedza, (2013) employed the Ordinary Least Square (OLS) regression method to establish whether external debt affects the level of poverty in Zimbabwe for the period 1980 to 2012. The study discovered that external debt servicing starved the Nation of its basic essential needs and compromised the government's efforts of providing education, health care, and infrastructural facilities. The authors settled that debt service has a negative impact on per capita income in the short run and deteriorate the maternal and infant mortality rate in Zimbabwe in the long run. In recent years Sansa, (2019) Used a Multiple Linear Regression approach to investigate the link between the public external debt, agriculture and the level of poverty in Tanzania over the period 2000 to 2018. The findings of this study confirm that the link between government debt and the incident of poverty is insignificantly negative. This shows that an increase in public debt in Tanzania worsened the incidence of poverty over the period.

Sheikh & Alam, (2013) used the OLS technique to examine the external debt and poverty nexus in Pakistan from 1985 to 2010. The findings of the study show that the high level of public indebtedness and debt service aggravates the incidence of poverty. Another study by Farid & Farid, (2016) used the Augmented Engel-Granger (AEG) test and Ordinary Least Square (OLS) method to examine the effect of public external debt on socio-economic wellbeing in Pakistan for the period 1973 - 2013. The AEG test result indicates the existence of cointegration and the long-run bond between the public external debt and the incidence of poverty. This result confirms robust evidence that the poor economic performance of Pakistan has worsened its economic slump and increased the level of poverty. Thus, the rising public external debt services of Pakistan exacted a negative effect on the level of poverty and income inequality. This is because very little money was left to finance social expenditures and poverty alleviations.

Loko et al., (2003) conducted a study on sample of 67 low income developing countries to investigate the impact of public indebtedness on the incidence of poverty using the life expectancy,

gross rates of primary enrolment and infant mortality rate. The study confirms that when the income related poverty is taken care of, all other debt burden indicators can have a negative impact on the infant mortality, life expectancy and level of education. In another study Zaghdoudi, (2017) used a panel cointegration model on a sample of 25 less developed countries to explore the effect of public external debt on the level of poverty for the period 2000 to 2015. The study confirms a positively robust evidence of the existence of a long-run relationship between the public external debt and level of poverty. The result further confirms a significant negative relationship between the level of poverty, condition of health, infrastructure, and trade openness. Moreover, the results of the causality test confirm the presence of bidirectional causality between the level of poverty and public external debt in both the short run and long run. Thus, the paper concludes that public external debt of the developing countries worsens the incidence of poverty. More recent study by Tung, (2020) applied panel regression technique via fixed-effects and random-Effects on a sample of 17 developing and emerging economies of Asian pacific region to examine whether public debt has any effects on social development indicators for the period 1980 to 2018. The findings of this study confirm that public debt has an adverse effect on social development indicators. Additionally, the study confirms that public debt exerts a significant negative effect on GDP per capita and domestic investment. The study also, confirms that while public debt has a significant positive impact on the incidence of poverty, a negative effect is discovered on income inequality. Lastly, the Granger causality test shows that extreme level of poverty is one of the important reasons that encourage governments to collect more debt in the future.

In summary, the literature reviewed indicated that most of the existing literature are on a single country study which cannot explain the impact of debt on large sample of developing countries like sub-Saharan Africa. Therefore, there is the need to remodel the impact of public debt on the incidence of poverty on

SSA to unearth the causes of extreme poverty in the region. Moreover, the present study not only looks at the relationship between the public debt and incidence of poverty but also goes further to ascertain the role of institutional quality in mediating the impact of public debt on the incidence of poverty in SSA. Unlike the previous work, this study used System GMM approach on the most recent data from world bank and worldwide governance indicators on a sample of 42 SSA for the period 2011 to 2019.

Materials and Methods

To investigate the nexus between the public debt and incidence of poverty, a cross-sectional data of 42 SSA countries from 2011 to 2019 were drawn from two important sources. These are World Development Indicators and World Governance Indicators databases. The data used for this research has a maximum of nine (9) years. However, due to likelihood of a strong correlation between the indicators and the consequent risk of multicollinearity, this study follows Easterly, W., & Levine, (1997) and combine the six institutional indicators and formed a single index called institution.

Estimation Procedure

To examine the relationship between public debt and incidence of poverty a system GMM approach was employed. This method was found to be suitable because of its estimation power that is comparably better than any other panel approaches (fixed effects, random effects and pooled ordinary least square). Apart from tackling the endogeneity problems, this technique is found to be capable of eliminating country and time-specific effect as suggested by Arellano & Bond, (1991). While they recommend this estimation technique to address the abovementioned problems, Blundell & Bond, (1998) have identified some potential weaknesses associated with it. They argued that lagged levels as an instrument appears to be ineffective for first difference variables, particularly when close to a random walk. Therefore, they suggest certain modifications which

improved the difference estimator and include the lagged levels and lagged differences. While “Two-step” asymptotically appears more operative than estimating with a one-step technique, standard errors were likewise blamed of biasedness when estimating with two-step. Consequently, to solve this problem “Xtabond2” was introduced by Roodman, (2009) which improved the “two-step” covariance matrix. Therefore, a “two-step system GMM technique” is far better than a “one-step”. For this reason, a “two-step system GMM approach” was used to examine the relationship between public debt and incidence of poverty in SSA. Moreover, to determine the reliability of the “GMM estimator”, the strength of the lagged values was used to ascertain all the poverty regression models. This was made possible by paying particular attention to the Hansen test. Thus, there is no correlation between the instrumental variables with the residual when the null hypothesis is not rejected, and this satisfied the required orthogonality conditions. Similarly, the serial correlation test was conducted to prove the absence of any second-order serial correlation.

Model Specifications

In the absence of a clear-cut macroeconomic theory that highlight the direct link between public debt and the incidence of poverty, the classical poverty model by Le Goff & Singh, (2014) is employed. The model has been augmented with debt and institutional quality variables to test for its impact on public indebtedness and the incidence of poverty as specified below.

$$HFCE_{it} = \phi_0 + \lambda_1 HFCE_{it-1} + \phi_2 DEB_{it} + \phi_3 INS_{it} + \phi_4 RGDP_{it} + \phi_5 EMP_{it} + \phi_6 INF_{it} + e_{it} \quad (I)$$

where HFCE is the Household Final consumption Expenditure per capita, which is a proxy used to capture the incidence of poverty. DEB are the three indicators used to measure the level of public debt. GDP represents the real income per capita in an economy; EMP is the rate of employment, INF is the rate of inflation, INS is the institutional quality.

More so, the role of institutional quality in ensuring proper utilization of public debt have been documented in the literature (Daud & Podivinsky, 2014; Sani et al., 2019). This study, followed Chang et al., (2009) by introducing the interaction term in the model, to ascertain whether debt-poverty nexus depends on the quality of the institutions in SSA, as shown below:

$$HFCE_{it} = \phi_0 + \lambda_1 HFCE_{it-1} + \phi_2 DEB_{it} + \phi_3 (DEB * INS_{it}) + \phi_4 INS_{it} + \phi_5 GDP_{it} + \phi_6 EMP_{it} + \phi_7 INF_{it} + e_{it} \quad (II)$$

The equation (I) and (II) are different because of the use of the interaction term. Thus, the impact of the public debt on poverty in equation (II) is expected to be contingent on the outcome of the conditioning variables (Brambor et al., 2005) using the following derivatives:

$$\frac{\delta Pov_{it}}{\delta LDEB_{it}} = \phi_2 + \phi_3 INS_{it} \quad (III)$$

where ϕ_2 represents the coefficient of the constitutive terms and that the ϕ_3 stand for the coefficient of the interaction term in model (II). Meanwhile, Kam, Robert, & Franzese, (2007) opined that the marginal effect cannot be decided by the used of standard errors because it cannot be averaged, therefore, they suggest the calculation of a different standard error for the new values considering the mean, minimum and maximum value as would be calculated in this study.

- I. **Poverty:** There is no unanimous agreement for a single accepted definition of poverty. Thus, measurement and definition of poverty remained a contentious issue. Poverty has been defined in terms of consumption, income level, and social exclusion, lack of capabilities or inability to satisfy human needs. While poverty line and poverty headcount index have been used to measure the incidence of poverty in the literature, more recent studies were found to use the household final consumption expenditure per capita. This study followed Datt & Ravallion, (1992) & Odhiambo, (2009) by using the household final consumption expenditure per capita as a proxy to capture the incidence of poverty in SSA.

Moreover, the poverty line was equally for a robustness check to confirm the validity of our results.

- II. **Public Debt:** This study used three debt variables to measure the magnitude of public debt accumulation in SSA. These are the percentage of debt to GDP ratio, debt to export ratio, and percentage of debt service to export ratio. The first indicator was used to measure the resource base in the country, the second indicator measures the repayment ability of a country (solvency) and last indicator measures the debt crowding out effect in the country. Following Loko et al., (2003), the study look at the impact of these indicators separately in different models. Their expected sign is negative.
- III. **Real Income per Capita:** In this study real income per capita was used to capture the level of development in the region. This variable is expected to affect the incidence of poverty negatively. This because, an increase in the level is expected to take people away from the circle of poverty. Thus, an improvement in the level of development leads to a reduction in the level of poverty. The use of this proxy for the economic development has empirical backing from (Kpodar & Singh, 2011; Le Goff & Singh, 2014).
- IV. **Rate of Employment:** The rate of employment refers to the proportion of the labour force that are employed. This study used the proportion of youth unemployment measured as percentage of total labor force ages 15 to 24 estimate by ILO. The more people are employed, the more they move out of poverty. Hence, people are expected to move out of poverty when they are employed. The expected sing of this variable is positive. Previous study used this variable to measure the incidence of poverty (Sheikh & Alam, 2013).
- V. **Rate of Inflation:** The rate of inflation measures economic stability in the economy. When the rate of inflation is high poor people are said to be more disadvantageous than the richer,

this is because an increase in the price of goods and services worsens the economic situations of the low-income earners and thus aggravate the level of poverty. Hence, inflation is expected to have a positive influence on the incidence of poverty. Le Goff & Singh, (2014) used this variable to capture the level of economic stability in the country.

VI. **Institutional Quality:** The term institutions and governance were used interchangeably to mean the same thing (Kaufman & Kraay, 2008). Institutional quality refers to the “manner through which public officials and institutions acquire and exercise the authority to shape public policy and provide public goods and services” (World Bank, 2007). It comprises of the Absence of Violence/Terrorism, Voice and Accountability, Control of Corruption, Political Stability, Government Effectiveness, Rule of Law and Regulatory Quality. These variables are measured on a scale of –2.5 to 2.5 score. The higher the score the better the institutional quality in the country and vice versa. Good institutions are expected to reduce the incidence of poverty.

Results and Discussions

To see the normality and appropriateness of the series descriptive statistics and correlation matrix presented in Table A and B were deemed necessary as shown below.

Panel A: Descriptive Statistics

	<u>HFCE</u>	<u>DEBGDP</u>	<u>DEBEXP</u>	<u>DEBSEXP</u>	<u>RGDP</u>	<u>EMP</u>	<u>INF</u>	<u>INS</u>
Mean	1380	37.15	7.52	5.167	2367	61.84	144.47	-.57
St. Dev.	1444	22.89	5.79	4.27	4.27	13.33	88.35	.58
Min	189	4.91	.49	.25	208	37.59	101	-1.78
Max	7478	140.78	140.77	33.84	18254	87.82	1344	.93
Observ.	378	378	378	378	378	378	378	378

Panel B: Correlations Matrix

	<u>HEXP</u>	<u>DEBGDP</u>	<u>DEBEXP</u>	<u>DEBSEXP</u>	<u>RGDP</u>	<u>EMP</u>	<u>INF</u>	<u>INS</u>
HEXP	1.0000							
DEBGDP	0.1562	1.0000						
DEBEXP	0.1764	0.4259	1.0000					
DEBSEXP	0.1101	0.4194	0.7036	1.0000				
RGDP	0.7799	0.0703	0.1339	0.1150	1.0000			
EMP	-0.491	-0.1323	0.0265	-0.1451	-0.4261	1.0000		
INFR	-0.053	0.2032	0.0057	0.0241	-0.0689	-0.1064	1.0000	
INST	0.5379	0.2969	0.1143	0.0268	0.3171	-0.1537	-0.1536	1.0000

Notes: HFCE= Household Final Consumption Expenditure measure the rate of poverty, DEBGDP = Ratio of public debt related to GDP, DEBEXP = ratio of public debt related to Export, DEBSEXP = ratio of public debt service related to Export, GDP = Real Per Capita income, EMP = Unemployment rate, INF = Inflationary rate, INS = Institutional Quality.

The descriptive statistics presented in table A above shows that our series are well spread, normally distributed with significant variations amongst them. This justified the use of a panel estimation approach for this analysis. The nature and magnitude of the link between the variables are shown in Table B using the correlation matrix. The results of this analysis showed no high correlation amongst the variables. Thus, the variables used in the models were within the normal range which ruled out the possibility of multicollinearity. Moreover, the results showed that all debt indicators and rate of unemployment showed negative sign, while per capita income, rate of inflation and quality of institutions showed positive sign. This demanded for a more sophisticated technique to ascertain the exact nature of the relationship among the variables.

Table 1: Relationship between Public Debt and incidence of Poverty

INDEPENDENT VARIABLE	(1) HFCE	(2) HFCE	(3) HFCE
L.HFCE	0.959*** (852.80)	0.813*** (387.93)	0.937*** (713.95)
DEBGDP	-0.456*** (-9.26)		
DEBEXP		-7.962*** (-16.25)	
DEBSEXP			-2.036*** (-4.15)
GDPC	0.0202*** (65.37)	0.0641*** (109.24)	0.0305*** (63.33)
EMP	-0.911 (-1.80)	-7.780*** (-13.13)	-2.285*** (-4.43)
INF	-0.0963*** (-6.45)	-0.0639*** (-4.10)	-0.178*** (-14.19)
INS	135.0*** (53.57)	180.6*** (71.83)	179.1*** (83.23)
CONSTANTS	171.2*** (5.31)	665.8*** (19.93)	-21.75 (-0.69)
OBSERVATION	336	336	336
INSTRUMENTS	39	38	39
GROUP	42	42	42
AR2	0.161	0.162	0.176
HANSEN	0.999	0.989	0.998

Note that: Standard error were stated in parentheses * ** *** As 10 %, 5% and 1% respectively.

Notes: With the exception of Institutions all the variable used in the model were converted into a log form, HFCE= Household Final Consumption Expenditure measure the rate of poverty, DEBGDP = Ratio of public debt related to GDP, DEBSEXP = ratio of public debt service related to Export, DEBEXP = ratio of public debt related to Export, GDP = Per Capita income, EMP = Unemployment rate, INF = Inflation rate, INS = Institutional Quality.

Table 3 above presents the estimated results on the link between public debt and incidence of poverty in three separate columns. As stated earlier, three alternative debt indicators were used which are comprised of the ratio of debt to GDP, debt service to export and public debt to export ratio respectively. Meanwhile, the negative coefficient shown in all the models indicated that an increase in public debt had worsened the incidence of poverty and vice versa. Moreover, the lagged

dependent variables in the models were found to be statistically significant which justified the use of dynamic model in this analysis.

The empirical results on the relationship between the public debt to GDP ratio, debt service to export and public debt to export ratio in column 1, 2 and 3 showed significant negative relationship with Household Final Consumption Expenditure. The results indicated a 1 percent increase in public debt to GDP ratio, debt service to export ratio and public debt to export ratio were associated with a decrease in Household Final Consumption Expenditure by 0.5 per cent, 8 per cent, and 2 per cent respectively. Thus, the relationship between the public debt and the incidence of poverty is negative. This revealed that public debt accumulation has a direct negative impact on Household Consumption Expenditure per capita which aggravates the incidence of poverty. This result is not surprising, as it conforms with the findings of Zaghdoudi & Hakim, (2017) as well as Farid & Farid, (2016) who among others discovered that public debt has a direct positive impact on the incidence of poverty.

The real income per capita was found to have a direct positive connection with the Household Final Consumption Expenditure and income per capita. This suggests that an increase in per capita income potentially decreases the level of poverty in a country. This result therefore, indicates that a 1 percentage increase in GDP is associated with an increase in household final consumption expenditure by 0.02 per cent, 0.06 per cent, and 0.03 per cent respectively that concurs with the previous studies (Datt & Ravallion, 1992; Ravallion & Chen, 2001). Consequently, an increase in per capita income, all things being equal, reduced the incidence of poverty through certain complementary structural programs. Thus, increase in economic growth is an important policy instrument for poverty alleviation.

The coefficients of the relationship between the rate of employment and Household Final Consumption Expenditure in all the three models have shown a statistically significant positive at 0.9%, 8%, and 2% respectively. This suggests that an increase in the rate of employment reduces the incidence of poverty. This corroborate the previous studies (Adenike, 2014; Aiyedogbon & Ohwofasa, 2012). Moreover, inflation is seen to drastically affect the poor people harder through the rising cost of living which eats-away the integral part of their wages. The coefficients of the estimated results across the models have shown that the relationship between the rate of inflation and Household Final Consumption Expenditure is significantly negative. The results therefore showed that a 1 percent increase in the rate of inflation worsened the incidence of poverty by 0.09%, 0.06%, .0.2% respectively. Hence, to alleviate the incidence of poverty in SSA inflation needs to be curtailed. This result conforms with the findings of Coleman, (2012) when he explored the dynamics of inflation and the rate of poverty in Ghana.

Meanwhile, good institutions have been recognized as veritable tools for effective utilization of public debt for the stimulation of economic growth and reduction of the incidence of poverty which is found to be true in this study. The results presented in table 3 below have shown that good institutions are panacea to reducing the incidence of poverty. The empirical result confirmed that an improvement in the quality of the institution increases the household final consumption expenditure in the country, and therefore reduces the incidence of poverty. This result corroborated the findings of Sanjeev Gupta et al., (2002) who confirmed, a reduction in the level of corruption reduces the level of poverty and income inequality in the country.

Table 2: Interaction term of Institutional quality and Public Debt on Poverty Nexus

INDEPENDENT VARIABLE	(1) HFCE	(2) HFCE	(3) HFCE
L.HFCE	0.983*** (1078.60)	0.901*** (539.33)	0.913*** (642.27)
DEBGDP	-0.798*** (-20.51)		
DEBGDPINS	1.842*** (20.53)		
DEBEXP		-11.60*** (-68.08)	
DEBEXPINS		12.62*** (26.10)	
DEBSEXP			-3.055*** (-10.40)
DEBSEXPINS			2.653** (2.95)
GDP	0.0137*** (89.29)	0.0369*** (87.70)	0.0366*** (35.94)
EMP	1.596*** (5.06)	0.433 (1.49)	1.918*** (3.62)
INF	-0.193*** (-13.99)	-0.0542*** (-3.91)	-0.140** (-3.24)
INS	4.146 (1.15)	41.42*** (9.24)	208.2*** (19.80)
CONSTANT	106.5*** (5.18)	80.65*** (3.90)	264.4*** (5.62)
OBSERVATION	336	336	336
INSTRUMENTS	40	40	40
GROUP	42	42	42
AR2	0.157	0.148	0.154
HANSEN	0.336	0.338	0.339

Note that: Standard error were stated in parentheses * ** *** As 10 %, 5% and 1% respectively.

Notes: HHFCE= Household Final Consumption Expenditure measure the rate of poverty, DEBGDP = Ratio of public debt related to GDP, DEBSEXP = ratio of public debt service related to Export, DEBEXP = ratio of public debt related to Export, GDP = Per Capita income, EMP = Employment rate, INF = Inflationary rate, INS = Institutional Quality. Table 4 presents the regression results based on the interaction specifications between public debt

indicators and institutions to confirm with the contingency effect. The regression result of the interaction term was found to be statistically significant and positive across the models. Thus, the negative impact of public debt on poverty decreased or disappeared with the improvement in the

quality of the institutions. Accordingly, the negative sign of debt-poverty nexus turned out to be positive and statistically significant at 1 per cent. Thus, the negative effect of public debt on poverty is reversible or could be averted if the quality of the institutions is improved. This showed that the impact of debt on poverty depended on the quality of the institutions in the country. The finding supports the view that improvement in the quality of institutions is required to enjoy the unwavering benefit of public debt policy (Sani et al., 2019). Henceforth, the role of institutional quality is both direct and indirect. This result also concurred with the findings of Addae-Korankye, (2014; and Sanjeev Gupta et al., (2002) who confirmed, institutions played a vital role in poverty reduction. This implied that the use of public debt to stimulate growth, development and eventually improve the living condition of the citizens is contingent on the quality of the institutions. Thus, a country with good institutions can effectively utilize its debt to stimulate economic growth, achieve socio-economic development and avert the needles consequences of public debt accumulation.

Table 3: Marginal effect of public indebtedness on Poverty

Measurement of	Institution at Minimum		Institution at Average		Institution at Maximum	
	M E	S E	M E	S E	M E	S E
Debt Burden						
Debt Service-to-Export	-.4379***	.5819	-2.862***	.5023	6.966***	.9610
Debt-to-Export	-.0965 ***	.0217	-.0095	.0069	.1414***	.0319
Debt to GDP ratio	-.0029 ***	.0015	.0058	.0031	.0169 ***	.0082

Note: ME = Marginal Effects, SE = Standard Error

Table 3 above ascertained that the impact of public debt on the incidence of poverty is contingent on the quality of the institutions. The results indicated that the marginal effect of the impact of public debt on the incidence of poverty is not the same at the different levels of the quality of the institutions. It showed that the impact varied depending on the quality of the institutions. The result

of the marginal effect of public debt on the incidence of poverty appears to be worse when the quality of institutions is at minimum, and less or even positive at maximum level as shown below.

Robustness check

Table 4: Relationship between Public Debt and Poverty Using Poverty Line

INDEPENDENT VARIABLE	(1) POV	(2) POV	(3) POV
L.POV	0.949*** (430.69)	0.987*** (362.44)	0.841*** (170.11)
DEBGDP	0.0803*** (9.41)		
DEBEXP		0.0237*** (5.20)	
DEBSEXP			0.155*** (12.24)
GDP	-0.0000437 (-1.96)	-0.00000790 (-0.41)	-0.0000317 (-0.91)
EMP	-0.0710*** (-4.94)	-0.0156 (-1.24)	-0.144*** (-17.18)
INF	0.0136*** (18.08)	0.00692*** (26.00)	0.0111*** (35.41)
INS	-2.422*** (-14.59)	-1.331*** (-7.72)	-0.932*** (-9.26)
CONSTANT	-0.257 (-0.28)	0.839 (1.14)	-3.459*** (-5.48)
OBSERVATION	336	336	336
Instrument	39	39	39
Group	42	42	42
AR2	0.533	0.532	0.534
Hansen	0.998	0.997	0.998

Note that: Standard error were stated in parentheses * ** *** As 10 %, 5% and 1% respectively.

Notes: POV: Poverty line to measure the rate of poverty, DEBGDP = Ratio of public debt related to GDP, DEBSEXP = ratio of public debt service related to Export, DEBEXP = ratio of public debt related to Export, GDP = Per Capita income, EMP = Employment rate, INF = Inflationary rate, INS = Institutional Quality.

The most popular indicator used for measuring the incidence of poverty has been the poverty line.

However, this indicator does not usually capture the multidimensional nature of poverty adequately, particularly the minimum standard of living. Considering the above limitations, this

study used the Household Consumption Expenditure per capita to examine the relationship between public debt and poverty in SSA. However, to further test the robustness of the findings, poverty headcount data for the same period 2010 – 2019 has been used as shown in table 6 above. The empirical result solidly supported the findings that public debt increases the incidence of poverty. Interestingly, the coefficients of the explanatory variables supported the earlier findings in terms of the signs and level of significance. Hence, the conclusion drawn from this study is robust.

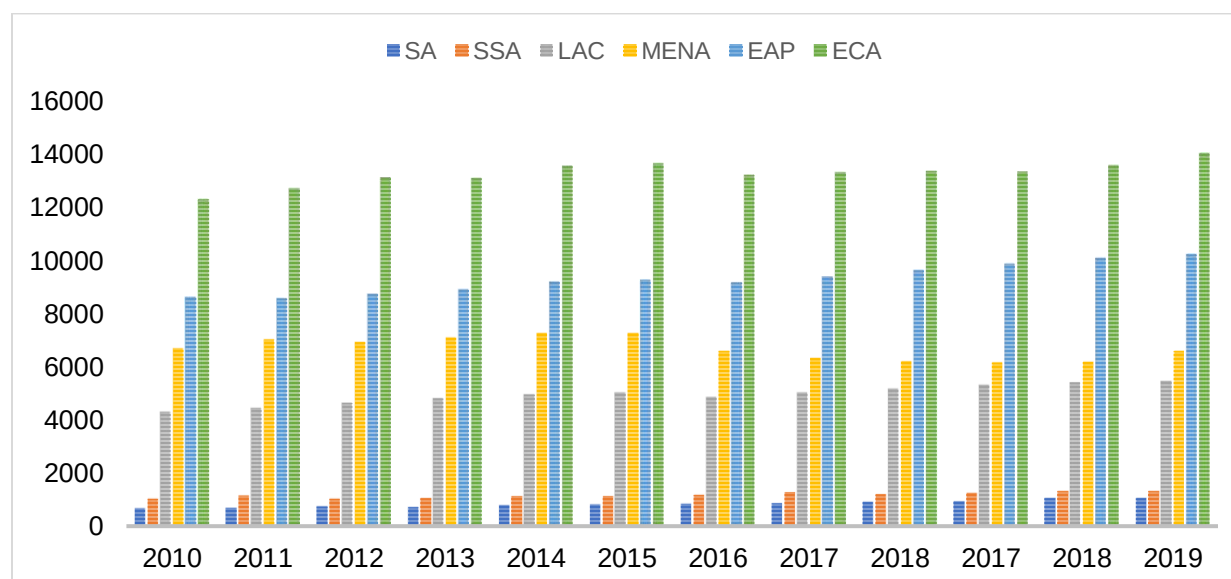
Conclusion and Policy Implications

This paper examined the relationship between public debt and incidence of poverty in SSA where poverty remains the issue of rising concern, and public debt predominantly burdensome. The GMM approach was used to investigate the relationship between the public debt and incidence of poverty on 42 SSA countries from 2011 to 2019. The findings of this study confirm that the link between public debt and Household Final Consumption Expenditure is negative. This shows that public debt worsens the incidence of poverty in SSA. Therefore, the rising public debt of SSA is one of the key drivers of extreme poverty disturbing the region. Moreover, the result of the conditional hypothesis of institutional quality showed that the role of public indebtedness in worsening the level of poverty becomes lower when the institutional quality score is at its maximum. Hence, good institutions play a crucial role in influencing the public debt policy of a country.

The paper therefore, concludes that the first Sustainable Development Goals (SDGs) set to eradicate the extreme poverty of developing countries by 2030, is unlikely to be met looking at the current trend of public debt accumulation amid poor institutional quality in SSA. This paper,

therefore, recommends comprehensive improvement of institutional quality together with a reduction of public debt accumulation as a progressive attempt to eradicate the incidence of poverty in SSA countries.

APPENDIX A: Household Consumption Expenditure Across the Regions



Note: SA= South Asia, SSA= Sub- Saharan Africa, LAC= Latin America & Caribbean, MENA= Middle East & North Africa, EAP=East Asia & Pacific, ECA= Europe & Central Asia

Appendix B. List of countries

Benin Botswana Burkina Faso Burundi	Eritrea Ethiopia Gabon The Gambia	Malawi Mali Mauritania Mauritius	Sierra Leone South Africa Sudan Swaziland
Cameroon Cape Verde Central African Rep. Chad Comoros Congo (Brazzaville) Congo (Dem. Rep)	Ghana Guinea Guinea-Bissau Kenya Lesotho Liberia Madagascar	Mozambique Namibia Niger Nigeria Rwanda Sao Tome & Principe Senegal	Tanzania Togo Uganda Zambia Zimbabwe

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