Indian Journal of Economics and Business
Vol. 20 No. 4 (December, 2021)

http://www.ashwinanokha.com/IJEB.php

Public Debt and Human Development in Africa: Is Economic Growth a game changer?

1st Edward Attah-Botchwey, 2ndEmmanuel Lawluvi, 3rdDorothy Akoe, 4thEdwin Boadu& 5thDavid Mensah Awadzie

Faculty of Business, Department of Banking and Finance, University of Professional Studies Accra, Ghana
Faculty of Business, Department of Banking and Finance, University of Professional Studies Accra, Ghana
Faculty of Business, Department of Banking and Finance, University of Professional Studies Accra, Ghana
Faculty of Business, Department of Banking and FinanceKoforidua Technical Universit, Ghana
Faculty of Business, Department of Accounting and Finance, Accra Institute of Technology, Ghana

* *Corresponding author:* edward.attah-botchwey@upsamail.edu.gh

Received: July 23, 2021
Revised: August 26, 2021
Accepted: September 15, 2021

Abstract: This paper studies the relationship between public debt and human development in Africa, and examines the moderating role of economic growth in the relationship. The System-Generalised Method of Moments model is adopted for data estimation on 47 countries obtained from United Nations Development Program and World Development Index from 2000 – 2017. The results indicated that human development is generally low in Africa as over 61% of the countries fall below 50% mark on the Human Development Index scale. There is a negative relationship between public debt and human development, however economic growth influences human development positively. The study recommends that Africa governments should ensure strict fiscal discipline so that proceeds from borrowing will be invested in productive sectors such as education and health that will boost economic growth and promote human development.

Keywords: Economic growth, Human Development Index, Public debt

1. Introduction

Public debt is a major concern of African countries as many of them suffer from debt overhang. Despite the huge public debt, there is little to show for economic growth and human development. This study looks at the relationship between public debt and human development in Africa and examines the moderating role of economic growth in the relationship. Specifically, the study examines the effect of public debt on economic growth and investigates the likelihood of granger causality, the relationship of public debt and human development, and the moderating role of economic growth in the relationship between public debt and human development. The study demonstrates how the debt overhang theory explains the impact of public debt on economic growth and human development in Africa. In relevance, the study unravelling the relationship between public debt and human development will help

initiate policies to ensure public debts are more human development channelled instead of pursuing fiscal consolidation and other fiscal policies without consideration to the need for the people to enjoy long, healthy and meaningful lives.

Mencinger et al. (2015) asserted that the realised revenues of developing countries are often significantly less than governments expenditures and that attempt to close the budget deficit may severely hurt citizens. To this end, governments see public debt as the desired and affordable preference to finance economic development agenda through the national budgets. The important role of public debt in economic development of developing countries cannot be overemphasised. The assumption is that developing countries, especially, should use public debt to stimulate economic growth and development; debts contracted over time, should reflect in economic growth. This posit has spawned studies for both developed countries (Lof&Malinen, 2014; Lartey et al., 2018) and developing countries (Mencinger et al., 2015; Woo & Kumar, 2015; Owusu-Nantwi& Erickson, 2016). These studies measured economic growth in terms of GDP, unemployment rate, exchange rates, interest rates and inflation rates. Lin and Sosin (2001) related public debt to economic growth but explicitly did not link public debt to human development.

The basic postulate of the impact of public debt on economic growth is that public debt should impel economic growth. However, this postulate remains a mirage to economies as diverse theories exist: classical, Keynesian, neoliberalism and conventional. The exposition of the classical doctrine is that public indebtedness is not acceptable because it distorts private capital formation from its productive use to non-productive use, and this restrains economic growth and development. The logic is that government competes with the private sector for the same resources that would have been invested productively; hence public debt restrains growth. This exposition is however moderated to accommodate that some public debt level is necessary is stimulate economic growth and development.

The Keynesian view, widely advocated by Keynes (1937), countered the classical view on the grounds of the socio-economic and political dynamics of the first half of the 20th century. It holds that the expanded roles of government justify public borrowing to enable intervention in correcting imbalances and ensure economic growth. Government should accelerate the pace of economic growth in times of very slow growth or stagnation. This creates a budget deficit which requires debt financing leading to higher debt. But this budget deficit ultimately leads to higher private savings and investment as a result of an increase in aggregate demand. Such a positive debt-growth relation can only actualise if public debt is spent in productive areas and directed to market intervention remedies. Budget deficits should only be tolerated in periods of economic stagnation, and not acceptable when there is normality in the economy.

Economic liberalism of the 1970s changed economists view about public debt and economic growth. The neoliberal view holds that public debt is unacceptable under any condition. Public borrowing causes crowds out the private sector. In competition for loanable funds in the market, government dominates the market by offering higher interest rates which diverts private capital towards the public sector to finance public expenditure. No budgetary measure to stimulate economic growth in times of recession or stagnation will produce any positive result in the long run. Instead, this action disrupts and generates instability.

The conventional view on the public debt-economic growth relation combines classical and Keynesian theories. It explains that public debt on economic growth should be investigated over the short-, medium- and long-terms. In the short-term, public debt proves to improve economic growth for economies in recession or confronted with weak growth rates, and also when the actual growth is lower than the potential growth. This argument is reflective of Keynesian's view on the public debt and economic growth nexus. In the longer term, the classical view holds, and that productive resources account for economic growth. The indebtedness of budget deficit financing inhibits total savings, increases interest rate, lowers investments and reduces capital stock. Public debt impact on economic growth appears to be typically negative in the long run.

IMF et al. (2011) studied various countries over time and concluded that there is no simple relation between public debt and economic growth. While some studies concluded that public debt impels economic growth (Abbas & Christensen, 2010; Kourtellos et al., 2013; Spilioti&Vamvoukas, 2015), other studies found public debt restrained economic growth (Baldacci & Kumar, 2010; Barro, 2013). Also, the debt level is critical in the public debt-economic growth nexus. Grennes et al. (2010) stated that debt above 77% of GDP negatively affects economic growth, but moderate debt levels spur economic growth. Cicchetti et al. (2011) concluded on 18 OECD countries that public debt above 85% of GDP has no effect on growth.

To account for heterogeneity in fiscal uncertainty of different ecosystems, Ahlborn and Schweickert (2018) studied three country clusters; Liberal (Anglo Saxon), Continental (Core EU members) and Nordic (Scandinavian). Continental countries face more growth and were especially more successful at reducing negative public debt impacts than the liberal countries. In the liberal countries, public debt exerts neutral or even positive growth effects, but a non-linear relationship existed for Nordic countries. Findings from Gómez-Puig and Sosvilla-Rivero (2018) also indicated the existence of the different patterns of public debt on economic growth for the Euro member countries and supported the posit that public debt has negative impact on the long run performance of these countries but its short-run impact may be positive depending on the country.

The relative impact of public debt on economic growth is also dependent on the type of public debt. Saungweme and Odhiambo (2019) observed that external debt spurs economic growth and domestic public debt restrains economic growth in both long run and short run. Titus et al. (2016) found domestic debt to significantly spur economic growth. Abbas and Christensen (2010) found moderate noninflationary domestic debt levels spur economic growth in 93 low income and emerging economies. Charles (2012) found domestic debt stock holding by government to exceed the healthy threshold of 35% of bank deposits in Nigeria, and this restrained economic growth by crowding out private investment. These findings imply an inconclusive relation between domestic debt and economic growth. However, Abbas and Christensen (2010) and Presbitero (2012) emphasised that domestic debt can only spur economic growth when there is sound macroeconomic and institutional framework.

The debt overhang theory (pioneered by Myers, 1977) is principally used to investigate the negative relationship between public debt and economic growth. A country experiences debt overhang when its debt stock exceeds repayment ability and any new borrowing will benefit the existing debtholder by way of repayment and debt servicing. Eventually, this situation results in no positive effect on economic growth. Alas, the rising debt will force governments to impose more taxes on the people in order to

manage the fiscal balance and this constrains economic growth and human development. The additional taxes negatively affect the quality of life as measured by the human development indexes (Debrun&Kinda, 2016).

Public debt under condition of debt overhang may not reflect in human development. In the absence of debt overhang, public debt propels higher economic growth which reflects in improved human development (Égert, 2015). But, debt overhang as typical of Africa countries, Tarek and Ahmed (2017) argued that public debt could drive economic growth only in presence of strong governance and institutions that ensure that debt proceeds are channelled to productive projects that stimulate economic growth. Cooray et al. (2017) also emphasised that in existence of weak institutions and high corruption, public debt will unlikely influence economic growth in the desired manner, which could have spurred human development.

Arguably, countries take on more debt to invest in areas that mostly improve human lives. Public debt is a signal of governments' willingness to improve lives. The UNDP Human Development Report (1990) noted that the common denominator of development is creating an environment for people to enjoy long, healthy and creative lives. Sen (1997) makes a clear distinct between the means and ends of development; humans are the real end of all activities and development should aim at improving their achievements, freedom and capabilities. The proposition of UNDP and Sen has since awakened interest in the economic growth and human development relation.

Studies have found human development to significantly influence economic growth (Pradhan & Abraham, 2002; Appiah et al., 2019), although Mustafa et al. (2017) found human development insignificantly contributes to economic growth. On the other hand, some studies concluded that human development depends on economic growth (Teker&Güner, 2016; Ramesh & Abebe, 2016; Khan et al., 2019). However, the general posit is that there is bi-directional association between economic growth and human development. Ramirez et al. (1997) studied the reversal causality of economic growth and human development, and observed bi-association of these variables, but emphasised that the sequential priority should be on human development. Suri et al. (2011) corroborated the bi-directional nature of the relation between economic growth and human development, and also indicated that human development is a critical input into economic growth.

The low level of human development and rising public debt in Africa raises questions about the association between the public debt and human development in Africa. The HDI data from 2000 to 2017 reveals that over 61% of African countries have very low human development. This study sets out to bridge the gap by investigating the association between public debt and human development with moderation of economic growth. The study adopts the conventional lens on public debt and economic growth nexus. The rest of the paper is organised as follows. The next section presents the methodology. This is followed by discussion of the empirical results. The final section concludes the study.

2. Method

Our interest is to develop a model that shows the relation of public debt, economic growth and human development. Public debt is mainly to finance budget deficit which stimulates aggregate demand, thereby improving economic growth. Economic growth is not an end by itself but must propel human development reflective of enlargement of people's choice and expansion of human capabilities (UNDP

Human Development Report, 2019). The human development explained by the capability approach of well-being focuses on longevity, knowledge and decent living. These dimensions form the human development index (HDI).

Model specification

The methodology utilised in this study is the System-Generalised Method of Moments (SYS-GMM). In the literature, the SYS-GMM estimator is considered to be relevant to examine the effect of public debt on economic growth for its superiority and consistency (Butkus &Seputiene, 2018). This estimator is derived by simultaneously estimating two equations in levels and first difference. The in-levels equation uses lags of once differentiated explanatory variables as instruments and the first difference equation uses lagged levels of the explanatory variables as instrument.

Generally, panel regression is estimated as follows:

$$Y_{it} = \beta_0 + \sum_{j=1}^{k} \beta_j X_{j,it} + \varepsilon_{it} \tag{1}$$

In (1), Y_{it} is the dependent variable of country i at time; $X_{j,it}$ represents the independent variable of entity i at time t; β_0 is the intercept; β_j is the coefficient of the independent variables; ε_{it} represents the residual term.

The relationship between human development, economic growth and public debt with inflation and total population is model in SYS-GMM as follows in Equation (2).

$$HDI_{it} = \beta_0 + \beta_1 HDI_{it-1} + \beta_2 GDP_{it} + \beta_3 PD_{it} + \beta_4 \ln TP_{it} + \beta_5 CPI_{it} + \varepsilon_{it} \tag{2}$$

We hypothesise that economic growth moderates the relation between human development and public debt; this is expressed as:

$$HDI_{it} = \beta_0 + \beta_1 HDI_{it-1} + \beta_2 GDP_{it} + \beta_3 PD_{it} + \beta_4 GDP_{it} \cdot PD_{it} + \beta_5 \ln TP_{it} + \beta_6 CPI_{it} + \varepsilon_{it} \tag{3}$$

In subsequent models, the components of the HDI are respectively regressed on the independent and controlled variables.

$$EDUI_{it} = \beta_0 + \beta_1 EDUI_{it-1} + \beta_2 GDP_{it} + \beta_3 PD_{it} + \beta_4 \ln TP_{it} + \beta_5 CPI_{it} + \varepsilon_{it} \tag{4}$$

$$LEI_{it} = \beta_0 + \beta_1 LEI_{it-1} + \beta_2 GDP_{it} + \beta_3 PD_{it} + \beta_4 \ln TP_{it} + \beta_5 CPI_{it} + \varepsilon_{it} \tag{5}$$

$$ICI_{it} = \beta_0 + \beta_1 ICI_{it-1} + \beta_2 GDP_{it} + \beta_3 PD_{it} + \beta_4 \ln TP_{it} + \beta_5 CPI_{it} + \varepsilon_{it} \tag{6}$$

In these models, HDI_{it} is the human development index (HDI_{it-1} as its lagged value), $EDUI_{it}$ is education index ($EDUI_{it-1}$ as its lagged value), LEI_{it} is life expectancy index (LEI_{it-1} as its lagged

value), ICI_{it} is income index (ICI_{it-1} as its lagged value), GDP_{it-1} is economic growth (as mediating value), PD_{it-1} is public debt, $GDP_{it-1} \cdot PD_{it-1}$ is interaction of economic growth and public debt, CPI_{it-1} is inflation, and TP_{it-1} is total population.

The granger causality test is performed to find out whether human development granger cause economic development, after fitting a vector auto regression (VAR). HDI is said to granger cause GDP when given GDP, the past values of HDI are useful for predicting HDI (Granger, 1988). The study regress GDP on its own lagged values and on lagged value of HDI.

Variable description and data

The models are estimated using data from 2000 to 2017 for 47 countries out of 54 Africa countries of sovereign recognition by the United Nations.The original intent is to use census approach, but the data period needed is only available for 47 countries. As a rule of thumb, a country that has more than 3 years missing data on any of the variable of interest is dropped.

The variables, public debt (debt-GDP %), economic growth (GDP growth %), inflation (consumer price index), and population (total population) are all sourced from the World Development Indicators. The composite human development index (HDI) – health (life expectancy index), education (expected year of schooling) and standard of living (GNI) – is obtained from the UNDP database.

3. Findings and Discussions

The empiric of the study begins summary statistics of the variables as well as the association of the variables of interest. In Table I, HDI has a mean of 0.495 and standard deviation of 0.118 showing that human development is little below the average score of 0.500 with wide standard deviation. The country with the lowest human development scored HDI of 0.252 on a scale of 1.000 and most performing country scored HDI of 0.797. HDI is positively skewed in Africa, which shows that most countries fall above the mean HDI. For the components of HDI, EduI is weakest link in the HDI measure. Human development in terms of education is low in Africa. LEI and ICI have mean scores of 0.500 and above. This means that Africa does better in life expectancy and income on human development score.

Table I. Summary statistics of variables

Vars	Obs.	Mean	SD	Min.	Max.	Skewness
EduI	846	0.419	0.133	0.116	0.763	0.062
LEI	846	0.593	0.123	0.299	0.869	0.324
ICI	846	0.500	0.147	0.250	0.862	0.584
HDI	846	0.495	0.118	0.252	0.797	0.472
GDP	846	5.006	6.823	-62.08	42.00	0.361
PD	846	61.60	52.12	6.300	410.1	3.198
CPI	846	8.654	9.457	-9.800	44.36	1.516
lnTP	846	6.971	0.691	4.909	8.281	-0.831

GDP and PD are the regressors of the study. The statistics indicates mean GDP growth of 5% with standard deviation of 6.8%, and PD (public debt to GDP) is 61.60% with standard deviation of

52.12%, which confirms that debt levels are very high on the continent hence, the likelihood of debt overhang.

The minimum debt-to-GDP is 6.3% with highest been 410% and positively skewed. The alarming statistics on public debt calls for investigation into how it is transforming human development on the continent. Inflation (CPI) averaged 8.7% with standard deviation of 9.5% and worse inflation figure among the selected countries is 44.36%, but one country has experience deflation of 9.8%.

Table II exhibits the 18-year average HDI for the sampled countries. Four countries witnessed high human development; scored 70% and above, Seychelles leading with average HDI of 74.76%. Seven other countries scored between 60% – 69% on the human development scale. Over 61% of the countries performed below average in human development; scored less than 50% on the mean HDI. Most of the least performing countries are in West Africa and Central Africa regions and this has policy making implication. These sub-regions may not have paid necessary attention to human developments, and this reflects in the high levels of poverty in the regions. Possibly, these countries are not investing adequately in educational and health needs of the people.

Table II. Country specific average HDI from 2000 – 2017

Countries	AHDI		AHDI
Seychelles	0.7476	Guinea-Bissau	0.4714
Libya	0.7299	Zimbabwe	0.4698
Algeria	0.7109	Uganda	0.4650
Tunisia	0.7018	Benin	0.4633
Burundi	0.6934	Sudan	0.4573
Gabon	0.6632	Togo	0.4549
Egypt, Arab Rep.	0.6551	Rwanda	0.4476
South Africa	0.6460	Senegal	0.4466
Botswana	0.6400	Cote d'Ivoire	0.4357
Cabo Verde	0.6183	Gambia	0.4300
Morocco	0.6047	Djibouti	0.4296
Namibia	0.5911	Malawi	0.4239
Equatorial Guinea	0.5699	Liberia	0.4003
Sao Tome and Principe	0.5368	Guinea	0.3955
Ghana	0.5367	Congo, Dem. Rep.	0.3928
Kenya	0.5234	Ethiopia	0.3845
Zambia	0.5197	Mozambique	0.3813
Nigeria	0.5089	Mali	0.3806
Angola	0.4981	Sierra Leone	0.3687
Madagascar	0.4920	Burkina Faso	0.3570
Cameron	0.4871	Chad	0.3568
Lesotho	0.4851	Central African Rep.	0.3370
Mauritania	0.4817	Niger	0.3058
Tanzania	0.4736		

To check the possibility of multicollinearity of the variables, a pairwise correlation matrix is constructed in Table III. It is however worthy to note that the presence of multicollinearity in this dataset is surmounted by the SYS-GMM estimation technique.

Table III. Correlation Matrix

Vars	1	2	3	4	5	6	7	8
EduI (1)	1.0000							
LEI (2)	0.4988	1.0000						
ICI (3)	0.7156	0.5322	1.0000					
HDI (4)	0.8935	0.7344	0.8966	1.0000				
GDP (5)	0.0004	0.1101	0.0809	0.0696	1.0000			
PD (6)	-0.1340	-0.0154	-0.1486	-0.1318	0.0515	1.0000		
CPI (7)	-0.0674	-0.2467	-0.0725	-0.1792	-0.0897	0.1846	1.0000	
lnTP (8)	0.0359	-0.0341	-0.1980	-0.0161	-0.0977	-0.1492	0.1376	1.0000

EduI has a strong positive association with LEI (0.50), ICI (0.72) and HDI (0.89). It is not surprising that there is very strong positive relation between EduI and HDI because education is a component of HDI. LEI has strong positive relation with ICI (0.53) and HDI (0.73) implying that whenever people live longer there is also increase in income and higher human development. The association between life expectancy and income per capita may be intriguing, but that which exists with human development is not surprising because income per capita is a measure of human development (Khan et al., 2019). Similarly, income as a component of human development has strong positive correlation with HDI. This means increase in income per capita is closely associated with increase in human development. EduI, LEI and ICI, thus, load very well onto the HDI as all of them have strong association above coefficient of 0.70.

HDI has a weak positive association with GDP (0.0696) and a weak negative association with public debt (–0.1318). Human development and economic growth move in the same direction but human development and public debt move in opposite direction. This is worth investigating for causal effect. Also, there is weak positive relation between economic growth and public debt, and this result corroborates with the results of Ramos-Herrera and Sosvilla-Rivero (2017).

Two-steps SYS-GMM estimation results are shown in Table IV. Model 1 shows the result of composite HDI on the independent and control variables whilst Model 2 introduces the interaction of public debt and economic growth. The results in Model 1 indicate that HDI is positively and significantly influenced by its lagged value and GDP at 1% significance level; human development is positively and significantly affected by economic growth in Africa. The causal relation between HDI and PD is negative and significant. Human development is negatively affected by public debt in Africa, implying that when public debt increases the life of the people worsens. Interestingly, human development has a significantly positive relation with the population of the countries. Human development in countries with large populations in Africa is better than those with smaller populations, all other things being equal. Inflation has negative impact on human development but statistically insignificant; thus, inflation is not a significant contributor to human development in Africa.

Model 2 re-estimated Model 1 to account for interaction between public debt and economic growth. In this case, whilst public debt has negative effect on human development, its interaction with economic

growth impacted positively and significantly on human development. This is evidenced by the regress of HDI on PD*GDP.

Table IV. SYS-GMM results using composite HDI

HDI	Model 1	Model 2
L.HDI	0.974***	0.966***
	(0.00367)	(0.00432)
PD	-6.52e-05***	-0.000232***
	(1.56e-05)	(3.74e-05)
GDP	0.00142***	-0.000119
	(8.85e-05)	(0.000321)
CPI	-0.000155	-3.39e-05
	(0.000104)	(0.000116)
lnTP	0.0250***	0.0218***
	(0.00324)	(0.00360)
*PD*GDP*		2.82e-05***
		(5.64e-06)
Constant	-0.158***	-0.124***
	(0.0230)	(0.0261)
Sargan test	0.323	0.291
AR(1)	0.000	0.000
AR(2)	0.199	0.182
Obs.	799	799
Number of id	47	47

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The Arrellano-Bond test conducted on the models and the results for Model 1 indicate significant AR(1) and insignificant AR(2); there is first lag autocorrelation but no autocorrelation of the second lag. In the Model 2, there is no serial correlation problem at second lag. This makes the dataset fit for purpose. The Sargan test both for Model 1 and Model 2 are insignificant, suggesting that there is over identification restriction.In Table V, the decomposition of HDI was to find out how each component regresses with the independent variables. In Model 4, EduI has significant positive relation with GDP and lnTP but negative relation with PD. Model 4 result is largely similar to that of Model 5 and Model 6. The results show some consistency between the decomposed HDI and the composite HDI.

Table V. SYS-GMM results using the decomposed HDI

	(4)	(5)	(6)
Variables	EDUI	LEI	ICI
L.EdUI	0.724***		
	(0.0151)		
L.LEI		0.955***	
		(0.00555)	
L.ICI			0.960***
			(0.00834)
PD	-0.00164***	-0.000239***	-0.000299***
	(0.000101)	(4.68e-05)	(6.34e-05)
GDP	0.00144***	0.000779***	0.00247***
	(0.000208)	(5.56e-05)	(6.54e-05)
CPI	-0.000350**	6.58e-05	0.000280***
	(0.000159)	(4.44e-05)	(8.69e-05)
lnTP	0.0235***	0.0458***	0.0153***
	(0.00492)	(0.00168)	(0.00264)
*EduI*PD*	0.00429***		
	(0.000253)		
*LEI*PD*		0.000564***	
		(8.33e-05)	
*ICI*PD*			0.000710***
			(0.000139)
Constant	-0.0520	-0.294***	-0.101***
	(0.0347)	(0.0112)	(0.0200)
Sargan test	0.525	0.516	0.536
AR(1)	0.000	0.000	0.000
AR(2)	0.236	0.132	0.210
R-Sqaure	0.458	0.552	0.452
No. of instruments	23	23	23
Obs.	799	799	799
Number of groups	47	47	47

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Human development and economic growth

The development pursued by countries is often measured in terms of economic growth which is expected to improve the quality of life of the citizens in terms of human development. Our result indicates a significant positive relation between human development and economic growth. Further, see Table VI, the results indicate unidirectional relationship between human development and economic growth, and that human development granger causes economic growth. This shows that countries that invest in human capital grow faster. The results corroborate the results of previous studies (Tridico, 2007; Suri et al., 2011; Teker&Güner, 2016; Ramesh & Abebe, 2016).

Table VI. Granger Causality Wald Test

Equation	Exclude	Chi2	df	p-value
GDP	HDI	11.294	2	0.004
GDP	ALL	11.294	2	0.004
HDI	GDP	1.629	2	0.443
HDI	ALL	1.629	2	0.443

Human development contributes to sustained economic growth through diversity of links between the two variables. These links include increase in investment in health, education and skill training which improves human capital for economic development. Education positively affects economic growth through enhancement of technological capabilities and technical changes in the industry. Higher level of education of the workforce translates to higher productivity because more educated people are likely to be more innovative. Further, healthy workforce is more likely to contribute significantly to productivity thereby increasing economic growth.

Suri et al. (2011) noted that human development plays a critical role in determining economic growth and also an essential input to economic growth. This interdependent relationship creates a policy lacuna as to where to start from. However, the study suggested that a successful policy requires an early focus on human development not because of stronger direct impact but due to its input effect on sustained economic growth. Also, Rivera (2017) found a positive relationship between human development and economic growth. The study established a vicious cycle relationship between the two variables; however, the relationship was stronger from human development to economic growth. These findings contradicted an earlier study of Tridico (2007) that investing in human development is sufficient but not a necessary condition to achieve economic growth in transition economies and that the crucial impetus to development is institutional quality.

Human development and public debt

Our result shows a significant negative relationship between HDI and PD, as well as between the components of HDI and PD. Human development is derailed by public borrowing, the more a country borrows the lower the level of human development. Excessive public debt reduces the quality of human life. The extant literature is quiet on this relation, but deduction on studies on the public debt-economic growth nexus may be helpful. Studies (Ramos-Herrera &Sosvilla-Rivero, 2017; Butkus

&Seputiene, 2018) concluded that public debt negatively impact economic growth. Our result corroborates results that founded a positive relation between economic growth and human development. Economic growth is not an end in itself but is a means to an end, being better living condition of the people. We can thus argue that because economic growth and human development have positive relation, and if public debt constrains economic growth, then public debt reduces human development.

Eberhardt and Presbitero (2015) cautioned about over generalisation of the relation between public debt and economic growth because negative relationship occurs in the long run and among countries with high debt levels. But Cochrane (2011) asserted that high public debt could negatively affect economic growth even in the short-run. This presupposes that public debt is capable of affecting economic growth both in the short run and the long-run, as long as the public debt is high. In line with the debt overhang theory, countries that have disconnect between the amount of public debt and its repayment ability are likely to use the proceeds of new debt issues to repay and service old debt. Public debt will therefore not be reflective in development due to the diversion of the proceeds to other transfer payments instead of investment in development. This explains the negative effect of public debt on human development in both short run and long run among countries with debt overhang. Matandare and Tito (2018) alluded that it is typical to find governments in Africa borrow at high interest rate to retire old maturing debt, for which no sinking fund or similar provisions existed. Certainly, borrowing to pay off debt will not affect human development positively.

The negative effect of public debt on human development may also result from poor management of debt causing rise in country with associated huge debts servicing cost in terms of interest cost. Woo and Kumar (2015) indicated that at least 30% of total revenues of many African countries are used to meet interest obligation. This denies the human development sectors the use of tax revenues. Poor debt management in Africa is also noted to cause disproportionate public debt and development, both economic growth and human development (Tarek & Ahmed, 2017). Though public debt is increasing there is no commensurate improvement in the delivery of human development centred projects and services such as health and educational facilities and services. This can be described as debt overhang effect of developing countries.

Moderating role of economic growth on public debt and human development

The result shows that interaction of public debt and economic growth on human development has a significant positive impact. This is insightful as the negative impact of public debt on human development has changed to positive with the interaction. This means if public debt is deployed in productive ventures, economic growth leads to an improvement in human development. The empirical evidence that supports positive impact of public debt on economic growth argues that public borrowing invested in productive areas will boost economic growth through improved productivity and investment.

Government's fiscal policy aims to pursue prudent macroeconomic policies to advance the socioeconomic and wellbeing of its people through spending in education, health, infrastructure and other public services. A fiscally disciplined government borrows with the prime goal of achieving the fiscal objectives and therefore public debt will reflect directly in the level of improvement in socioeconomic condition of the country. Thus, interaction between public debt and economic growth impacts positively and significantly on human development, which is the socioeconomic life of the

people. This suggests that developing countries with fiscal discipline and quality institutions would be able to restrict the use of proceeds from borrowing to addressing the priority programme and projects of government and thereby improving economic growth and human development.

Effect of control variables

The study controlled for the effects of inflation and population of a country. The finding indicates that inflation has insignificant negative relationship with HDI. This shows that inflation has the potential to erode composite human development. The degree of the analysis of human development shows that the impact of inflation on life expectancy and income level is significantly negative. Inflation affects the cost of living and therefore increases the cost of seeking health care and living healthy life. Increase in inflation will negatively affect life expectancy. Similarly, income levels of people diminished with inflation as it increases the cost of goods and services thereby eroding the purchasing power. Education is not significantly affected by inflation, perhaps the cost of education is inelastic and not subjected to inflation induced increments. In some countries, education is free or near free so rising inflation could not have affected it significantly.

The study finds that population on human development is significantly positive; countries with large population have high HDI. Probably countries with large population are more likely to raise more taxes for investment in education, health and standard of living rather than public debt. The large population is also likely to be associated with increase productivity which will increase human development through economic growth.

4. Conclusion

The SYS-GMM estimation technique is used to investigate the impact of public debt on human development in Africa. The average human development in Africa is little below 50% and, approximately 61.7% of the 47 countries have HDI below 50%. Human development is significantly influenced by economic growth, but human development granger causes economic growth. Public debt impedes human development under debt hangover situations, where the public debt is not invested in critical areas of health and education but rather in ostentatious goods and transfer payments such as interest expense. The study interacts public debt and human development and finds a significant positive relation, which implies the interaction of public debt and economic growth is needed to boost human development in Africa. Inflation has no significant impact on the composite human development index but significantly erodes life expectancy and income levels as measures of human development. It has no significant effect on education. Population significantly affects human development as well as its components: education, life expectancy and income levels.

The findings of the study have important policy implications. African countries should prioritise human development in developmental agenda. African countries have focused on improving economic growth as means to achieve sustained development. The result shows that development direction from economic growth to human development is weaker than from human development to economic growth. African countries must reorient their development policies towards the pursuance of human development for better long run economic results. Such initiatives should focus on investing heavily in education and health and measure success of the country by the extent to which human living is improved rather than economic growth that does not reflect in the lives of the people.

To ensure sustainable public debt will not impede human development despite the debt overhang disposition, African countries should effectively manage public debt that will ensure that the purpose of borrowing is achieved subject to minimal level of fiscal risk. To reduce borrowing cost, control financial risks, and develop domestic markets, countries must well design their public debt management strategies. This will help to reduce or manage the debt hangovers of African countries over the years and ensure that new debt issued does not endanger human development. In addition, public borrowing should be restricted largely to areas that promote economic growth, which will in turn promote human development. Unnecessary public debt incurred on transfers and ostentatious goods and services should be completely avoided. Further, African countries should ensure fiscal discipline so as to curtail significantly the need for public borrowing. Government has to be disciplined in spending to avoid the need to borrow for consumption. Expenditures in the areas of education and health should be prioritised in the budget of African countries.

REFERENCES

Abbas, S. A. and Christensen, J. E. (2010), "The role of domestic debt markets in economic growth: An empirical investigation for low-income countries and emerging markets", IMF Staff Papers, Vol. 57 No. 1, pp. 209-255.

Ahlborn, M. and Schweickert, R. (2018), "Public debt and economic growth–economic systems matter", International Economics and Economic Policy, Vol. 15 No. 2, pp. 373-403.

Appiah, M., Amoasi, R. and Frowne, D. I. (2019), "Human development and its effects on economic growth and development", International Research Journal of Business Studies, Vol. 12 No. 2, pp. 101-109.

Baldacci, E. and Kumar, M. S. (2010), "Fiscal deficits, public debt, and sovereign bond yields, IMF Working Paper, Vol 184 No. 10.

Barro, R. J. (2013), "Health and economic growth", Annals of Economics and Finance, Vol. 14 No. 2, pp. 329-366.

Butkus, M. and Seputiene, J. (2018), "Growth effect of public debt: The role of government effectiveness and trade balance", Economies, MDPI, Vol. 6 No. 4, pp. 1-27.

Cicchetti, S. G., Mohanty, M. and Zampolli, F. (2011), "Achieving growth amid fiscal imbalances: the real effects of debt", Proceedings - Economic Policy Symposium – Jackson Hole, Federal Reserve Bank of Kansas City, pp. 145-196.

Charles, O. (2012), "Domestic debt and the growth of Nigerian economy", Research Journal of Finance and Accounting, Vol. 3 No. 5, pp. 45-56.

Cochrane, J. H. (2011), "Inflation and debt", National Affairs, Vol. 9 No. 2, pp. 56-78

Cooray, A., Dzhumashev, R. and Schneider, F. (2017). "How does corruption affect public debt? An empirical analysis", World Development, Vol. 90(C), pp. 115-127.

Debrun, X. and Kinda, T. (2016), "That squeezing feeling: the interest burden and public debt stabilization", International Finance, Vol. 19 No. 2, pp. 147-178.

Eberhardt, M., and Presbitero, A. F. (2015), "Public debt and growth: Heterogeneity and non-linearity", Journal of International Economics, Vol. 97, No. 1, pp. 45-58.

Égert, B. (2015), "Public debt, economic growth and nonlinear effects: Myth or reality?", Journal of Macroeconomics, Vol. 43(C), pp. 226-238.

Gómez-Puig, M. and Sosvilla-Rivero, S. (2018), "Public debt and economic growth: Further evidence for the Euro area", Acta Oeconomica, Vol. 68 No. 2, pp. 209–229.

Granger, C. W. (1988), "Some recent development in a concept of causality", Journal of Econometrics, Vol. 39 No. 1-2, pp. 199-211.

Grennes, T., Caner, M. and Koehler-Geib, F. (2010), "Finding the tipping point-when sovereign debt turns bad", Policy Research Working Paper Series 5391, The World Bank.

IMF, OECD, UN and World Bank (2011), "Supporting the development of more effective tax systems", A Report to the G-20 Development Working Group.

Keynes, J. M. (1937), "The general theory of employment", The Quarterly Journal of Economics, Vol. 51 No. 2, pp. 209-223.

Khan, N. H., Ju, Y. and Hassan, S. T. (2019), "Investigating the determinants of human development index in Pakistan: An empirical analysis", Environmental Science and Pollution Research, Vol. 26 No. 19, pp. 19294-19304.

Kourtellos, A., Stengos, T. and Tan, C. M. (2013), "The effect of public debt on growth in multiple regimes", Journal of Macroeconomics, Vol. 38, pp. 35-43.

Lartey, E. Y., Musah, A., Okyere, B. and Yusif, N. (2018), "Public debt and economic growth: Evidence from Africa", International Journal of Economics and Financial Issues, Vol. 8 No. 6, pp. 35-45.

Lin, S. and Sosin, K. (2001), "Foreign debt and economic growth", Economics of Transition, Vol. 9 No. 3, pp. 635-655.

Lof, M. and Malinen, T. (2014), "Does sovereign debt weaken economic growth? A panel VAR analysis", Economic Letters, Vol. 122 No. 3, pp. 403-407.

Matandare, M. A. and Tito, J. (2018), "Public debt and economic growth nexus in Zimbabwe", Journal of Economics and Sustainable Development, Vol. 9 No. 2, pp. 84-89.

Mencinger, J., Aristovnik, A. and Verbic, M. (2015), "Revisiting the role of public debt in economic growth: The case of OECD countries", Engineering Economics, Vol. 26 No. 1, pp. 61-66.

Mustafa, G., Rizov, M. and Kernohan, D. (2017), "Growth, human development, and trade: The Asian experience", Economic Modelling, Vol. 61, pp. 93-101.

Myers, S (1977), "Determinants of corporate borrowing", Journal of Financial Economics, Vol 5. No. 2, pp. 147-175.

Owusu-Nantwi, V. and Erickson, C. (2016), "Public debt and economic growth in Ghana", African Development Review, Vol. 28 No. 1, pp. 116-126.

Pradhan, J. P. and Abraham, V. (2002), "Does human development policy matter for economic growth? Evidence from Indian states", South Asia Economic Journal, Vol. 3 No. 1, pp. 77-93.

Presbitero, A. F. (2012), "Total public debt and growth in developing countries", The European Journal of Development Research, Vol. 24 No. 4, pp. 606-626.

Ramesh, R. and Abebe, A. (2016), "Has economic growth contributed to human development in Ethiopia?", Journal of Asian and African studies, Vol. 51 No. 6, pp. 641-655.

Ramirez, A., Ranis, G. and Stewart, F. (1997), "Economic growth and human development", Yale Economic Growth Center Discussion Paper No. 787.

Ramos-Herrera, M. D. C. and Sosvilla-Rivero, S. (2017), "An empirical characterization of the effects of public debt on economic growth", Applied Economics, Vol. 49 No. 35, pp. 3495-3508.

Rivera, M. A. (2017), "The synergies between human development, economic growth, and tourism within a developing country: An empirical model for Ecuador", Journal of Destination Marketing and Management, Vol. 6 No. 3, pp. 221-232.

Saungweme, T. and Odhiambo, N. M. (2019), "Does public debt impact economic growth in Zambia? An ARDL-bounds testing approach", SPOUDAI-Journal of Economics and Business, Vol. 69 No. 4, pp. 70–90.

Sen, A. (1997), "Human capital and human capability", World Development, Vol. 25 No. 12, pp. 1959-1961.

Spilioti, S. and Vamvoukas, G. (2015), "The impact of government debt on economic growth: An empirical investigation of the Greek market", The Journal of Economic Asymmetries, Vol. 12 No. 1, pp. 34-40.

Suri, T., Boozer, M. A., Ranis, G. and Stewart, F. (2011), "Paths to success: The relationship between human development and economic growth", World Development, Vol. 39 No. 4, pp. 506-522.

Tarek, B. A. and Ahmed, Z. (2017), "Institutional quality and public debt accumulation: An empirical analysis", International Economic Journal, Vol. 31 No. 3, pp. 415-435.

Teker, S. and Güner, A. (2016), "Whether development indices affect economic growth: A cross-country analysis. Procedia Economics and Finance, Vol. 38, pp. 340-346.

Titus, O. A., Chidi, O. T., Tochukwu, O. R. and Babatunde, O. O. (2016), "Domestic debt and economic growth in Nigeria: Data-based evidence", Greener Journal of Economics and Accountancy, Vol 5 No. 1, pp. 1-12.

Tridico, P. (2007), "Institutions, human development and economic growth in transition economies", The European Journal of Development Research, Vol. 19 No. 4, pp. 569-593.

UNDP Human Development Report (1990), "Concept and measurement of human development".

UNDP Human Development Report (2019), "Beyond income, beyond averages, beyond today: Inequalities in human development in the 21st century," United Nations Development Programme 1 UN Plaza, New York, NY 10017 USA.

Woo, J., and Kumar, M. S. (2015), "Public debt and growth", Economica, Vol. 82 Issue 328, pp. 705-739.