TAXES AND EXERNAL LONG TERM DEBT IN SUB-SAHARAN AFRICA

Akintoye, Ishola Rufus, Dada, Samuel Olajide; Owolabi, Kehinde Mutiyat

Department of Accounting, School of Management Sciences, Babcock University, Nigeria

Abstract: Advancement in the world economy have increased both the importance of external debts and the problem of debt accumulation by Sub-Saharan African (SSA) nations which rely on external borrowing for their economic development. The present study ascertained the effect of tax revenue on external long term debt stock of Sub-Saharan African countries and investigated the control effect of inflation, exchange rate and corruption on the impact of tax revenue on external long term debt stock (ELTDS) of SSA countries. Ex-post facto research design was adopted in testing and analyzing a dynamic panel estimated with system General Method of Movements (GMM) data set for the period 1990 to 2020 on 23 countries in SSA. Dynamic panel data was adopted because it uses lag of the regressors on the data set to eliminate weakness. The study found that lag of external long term debt stock is significantly affected by lag of Custom, Import and Export Duties (LCIED), lag of Taxes on Product (LTXP) and lag of Taxes on Goods and Services (LVAT) (J-stat 15.85 = 0.726, ϱ > 0.1). Exchange rate, inflation and corruption had significant control on the effect of tax revenue and external long term debt stock (J-stat 22.862 = 0.154, ϱ > 0.1) globally. With regards to considered individual P-value, the outcome was slightly differed; Lag of ELTDS was positively and significantly controlled by INF while EXR and CRP negatively and insignificantly controlled LELTDS of SSA countries. The study concluded that tax revenue improved financing of external long term debt stock of SSA countries. It was therefore recommended that governments of SSA nations ought to be strategic in maintaining sustainable external long term debt stock portfolio as the present debt to tax revenue ratio of SSA countries is below the world benchmark which is unsustainable and adversely affects their economies.

Keywords: Corruption, Debt, Exchange rate, External long term debt stock, Inflation, System General Method of Movements, Tax revenue.

1. Introduction

In Sub-Saharan Africa (SSA), high debt resulting in high servicing cost has threatened the region's economy and thwarted its advancement. This weighs heavily on the economy, with consequences such as high inflation, unemployment, increasing population of the poor, and pervasive corruption. Debt financing is the systematic regular payment of loans taken by a country from domestic and external sources. Each installment comprises the interest on debt and a part of the principal. Timely earning of income facilitates the financing of a country's debt repayment. Irregular income earning by government leads to default in the debt repayment schedule. The higher the volume of debt and interest rate the higher the burden of debt financing.

Reduction of debt burden through financing is a sure means of preventing the negative outcome of high debt servicing, exchange rate reduction and high inflation (Efuntade, Olaniyan & Efuntade, 2021). Again, debt reduction makes a country to reap the benefit of foreign investment the since level of external indebtedness is a means of evaluating a country's creditworthiness, debt sustainability and investment stability. The cumulative figure disbursed on debt service annually is often used to identify a country's ability to achieve steady foreign exchange through exports of goods and services. Therefore, the level of debt burden of a country has direct impact on the volume of debt service and the amount that will be available for fiscal engagements. High cost of financing long term debt erodes international reserves and funds meant for provision of social amenities to be used in debt expenditure. Although one might claim that the borrowed fund was used on projects that would finance the repayment, sometimes the borrowed fund are spent on projects whose prices are corruptly inflated.

Evidently, polices on debt accumulation and its reduction are often subjected to influences leading to debt burden, thus, manifesting as an impediment to fiscal advancement (Adegbite, Ayadi & Ayadi, 2008).

Advancement in the world economy has increased the importance of external long term debts and caused the problem of debt accumulation by the emerging nations of Sub-Saharan Africa which depend solely on external borrowing for their economic development (Aybarç, 2019; Vaggi & Frigerio, 2021). Debt postponement and refinancing credits are ways embraced by debtor country to defer already due debt usually because of lack of fund to make the payment. While debt postponement rearranges the payment due to a future date to enjoy a lower interest rate than the initial rate, refinancing credits is when a new debt with different terms of agreement is contracted with creditor country or institution to pay off the old debt. This is usually the means through which the creditor country directs the debtor country's economic policies to suit their objective.

Government actions are largely responsible for the SSA countries' debt problem through execution of extravagant and misguided policies in the application of borrowed funds for developmental projects. The buildup of external debt stock impacted by erratic changes in regulations that affect debt directly through high interest rate as well as exchange rate fluctuation all increased debt accumulation (Levin, 2019; World Bank 2021, Wells, Denham, Lester, Watson & Luff, 1994). African governments in their struggle to correct the debt accumulation that their actions created have embraced the process of structural and economic reforms. The expected resultant effect of the reforms should be evident in the continuous decline in debt service ratio to income of countries in the region, which will be significant to the indebtedness of the region (Adah & Akogu, 2019; Jelilov, Abdulrahman & Isik (2016)).

Government operations comes with huge financial outlay, most times, the government cannot fund, thus, the need for borrowing to meet up with the developmental projects which will be paid for into the future. The debt burden challenges facing the countries of the SSA region deteriorated due to the environmental issue of mismanagement of the loan by the governments of the day (Oyinlola, Adedeji & Oladipupo, 2020; Levin, 2019). Corruption is imbedded in the system so much that it has given room for debts to accumulate to the point that its financing through regular revenue is not enough. The weakened state of the economy raises some concerns, as well as the rising debt financing on limited aggregate revenue, notwithstanding that tax revenue is considered a stable source of income to government (Oyedokun, Fowokan, Akintoye & Dada, 2018).

Globally, most countries are indebted one way or another, the purpose is to meet their growth goals. Ibrahim, Abdulkadir, Aminu and Abdurra'uf (2019); Mbaye, Moreno-Badia and Chae (2018) asserted that the most indebted nations are the developed economies with well-planned means of funding the repayments. Among these heavily indebted countries are America, China, Japan and European countries. They owe a big percentage of the global debt. While increased public debt has been a feature of developing countries, Uchida and Ono (2020), World Bank, (2019) and Ibrahim *et al,* (2019) opined that SSA debts started to accumulate since independence. This is due in part to a shortfall in the expected revenue due to a fall in the crude oil price, commodity price, corruption, resources mishandling, exchange rate fluctuation and inflation. Therefore, the origin of SSA countries' debt problem can be traced to early stage of developmental efforts (Ezenwe, 1993). Most countries in the region had from independence commence public projects aimed at supporting their economies through donor support and usually with the use of foreign financing in the form of loans (Frenkel, Dooley &Wickham, 1989). They projected that the developmental projects would improve domestic industry and infrastructure to build national economies over time. The expected growth was to sponsor the debt financing obligation into the future (Nguyen, Van, Nguyen-Van, Barbier-Gauchard & Le, 2019). Unfortunately, this aim has not been achieved.

Hence, the need for the present study to ascertain the effect of tax revenue on external long term debt stock of SSA countries and to investigate the control effect of inflation, exchange rate and corruption on the effect of tax revenue on external long term debt stock of SSA countries. The objectives and hypotheses were set accordingly:

1. In what ways does tax revenue affect External Long Term Debt Stock of Sub-Saharan African countries?
2. What is the controlling effect of inflation, exchange rate and corruption on the effect of tax revenue on External Long Term Debt Stock of Sub-Saharan African countries?

H$_0$1: Tax revenue has no significant effect on External Long Term Debt Stock of Sub-Saharan African countries.

H$_0$2: Inflation, exchange rate and corruption have no significant controlling effect on tax revenue and External Long Term Debt Stock of Sub-Saharan African countries.

2. Literature review/ Theoretical Framework

2.1. Conceptual Review

Long term public debts are debts that the settlement extends beyond a year generally. According to Aybarç (2019). it is debt with more than five years to settlement. Examples of debt instruments are government bond, debts from multilateral financial institutions secured on agreements and intergovernmental agencies (Vaggi & Frigerio, 2021). The time lag required for repayment of external debts is often long term, while domestic loans are between medium to short term period. Both forms of debt and their repayment cannot be neglected, thus making the debt service burden a crushing responsibility (Iyoha, 1999).

Debt is categorized into three main groups according to maturity, resources, and voluntariness. Public debt according to maturity is further expanded to include: short-, medium and long-term public debts. Odo, Igberi & Anoke, (2016) defined public debt as the collective financial obligation acquired by all units of governmental parastatal of a country. They are further elaborated to include money payable to individuals, mutual funds, hedge funds, pension funds, foreign governments and financial institutions (Odo *et al*, 2016). Public debt reflects on all aspects of government liabilities both long term and short term for which the resources of a nation are applied in the repayment funding. The long term debt reference the duration of time lag allowed for the repayment of such debt as payable into the future. The forms of public debt signify the location of the lenders of such funds, lenders within the country are known as domestic or internal lenders; while lenders outside the country are the foreign or external lenders (Odo *et al*, 2016).

2.2. Theoretical Review/Framework

2.2.1. Theory of Public Debt

This classical theory of public debt was propounded among four economists between 1742 to 1859. It became orthodox being the first in the field of public debt. History of public debt theory is traced to the opinions of four classical British economists: Adam Smith, David Ricardo, Thomas Robert Malthus and John Stuart Mill (Bilan, 2016; Roberts, 1942). These orthodox schools of thought presumed that the perfect interplay of microeconomic and macroeconomic forces would balance the economy, thus, no need to incur debt. They concluded that government debt being and still is an impediment to economic progress (Holtfrerich, 2013). The origin of most public debt can be traced back to necessities of funding wars in various forms through funding of insurgencies and political unrest (Battaglini and Coate, 2007). Adam Smith's warnings prior to Britain's huge debt financing of War of Independence stand relevant even in the present world debt burden. He opined that to liberate public revenue, government debt must be zero without the burden of debt service (Holtfrerich, 2013).

The theory in support of government expenditure grew out of the arguments of 20th century John Maynard Keynes in the 1940s which sated that public expenditure determines the levels of income distribution in the economy. The assumption was that debt was taken to fund developmental projects; thus, he opined that government should borrow for public projects funding which would generate jobs to the citizenry thereby enhancing the purchasing power equality in the economy (Teupe, 2020; Odo *et al*, 2016). While public debt was basically considered an outcome of emergency situation like war, the present debt situation in SSA is not conclusively a result of war, but is due to continuous fiscal deficit (Holtfrerich, 2013). The reality of his postulation is evidenced that economic forces and combined effect of other forces keep pushing the economy into disequilibria.

2.2.2. Debt Overhang theory

The debt overhang theory came into limelight through the work of Howard in 1972 who became the originator of the theory (Asogwa, Okechukwu & Onyekwelu, 2018). Krugman (1988) defined debt overhang as a condition where the expected repayment of foreign debt falls short of the predetermined value of the debt. Borensztein (1990) asserts that debt overhang is a situation in which the benefits derived by the debtor country from the debt obtained is insignificant in view of the return on any additional investment because of the debt service obligations (Senadza, Fiagbe & Quartey, 2018; Krugman, 1988).

Sani and Yahaya (2021) explained that debt overhang generally happens when the level of indebtedness in a country exceeds her ability to pay. In their opinion, the predicament of debt overhang is mostly detrimental to poor nations because they will be trapped in a continuous cycle of indebtedness and debt servicing so much that there will be no funds for provision of essential needs. Therefore, the debt overhang hypothesis leads to uncertainty in government policies by preventing it from meeting up with fiscal responsibilities. Potential investors generally study the attitude of government concerning debt servicing to determine their investment prospect (Sani & Yahaya, 2021). From this theory, the situation of SSA countries and their debt predicament is explained to mean that viable investment opportunities elude them due to high debt burden.

Theoretical Framework

This study is hinged on theory of public debt and debt overhang theory, whereby the former postulated an economy without debt while Keynes supported debt targeted at funding developmental projects. Debt overhang theory exposed the reality of incurring debt based on the required repayment outlay which drains fund from the economy. Public debt to finance government expenditures which the economy would pay for into the future had proven detrimental to public revenue. Consequence on the continuous fiscal deficit, the initial aim of public debt had been defeated. The resultant effect is debt overhang, where nations are wallowing in debt financing at the detriment of the economy. The line of argument of authors in this regard is that debt depreciates the capability of a nation to maintain a sustainable economy, thus, the relevance to this study. In this study, we theorized that long term debt financing depends on earnings from taxes for repayment. These theories drive home the effect of tax revenue on long term debt financing.

2.3. Empirical Review

Mukhopadhyay (2022) searched for sustainable solutions to debt accumulation in SSA and found that debt relief requires a heterogenous approach as one-size-fits-all approach in the form of structural adjustment programs had proved futile. Sani and Yahaya (2021) discovered that the interaction between public debt and other variables with negative relationships could be averted or even reversed if the quality of the institutions improves in the region while the positive impact could be improved upon. The study of political economy of taxation, debt ceilings, and growth by Uchida and Ono (2020) showed that debt ceiling enables the government to shift the tax burdens from the older to younger generations, while it stimulates physical capital accumulation and may increase public education expenditure, resulting in a higher growth rate. This showed that taxes are relevant in debt ceiling and growth in the economy. Onakoya, Afintinni and Ogundajo (2017) in their study on tax revenue and economic growth in Africa found that tax revenue is positively related to GDP and promotes economic growth in Africa. Likewise, Njoku, Ozurumba, Chris-Ejiogu and Chigbu's (2020) study on fiscal policy and economic development in SSA with emphasis on poverty in Ghana and Nigeria discovered that a unit change in tax revenue results in a 0.01046-unit reduction in poverty in Nigeria in the short run. While in Ghana, the result showed a long run relationship exists between fiscal policy and poverty reduction. Hassan and Meyer (2021) explored the channels of transmission between external debt and economic growth with evidence from SSA countries, and found public, private investment and total productivity factor as channels transmitting indirect, while interest rate has direct effect between external debts to economic growth. Estimates indicated that savings are not a channel of transmission from external debt to economic growth in SSA. Ehikioya, Omankhanlen, Osuma & Inua, (2020) investigated the dynamic relations between public external debt and economic growth in African countries, while asking if it is a curse or blessing. Findings showed evidence that support a long-run symmetry relationship between external debt and economic growth in Africa. The result demonstrates that beyond a specific capacity, the short-run converges to equilibrium in the long-run and external debt would start to have a deteriorating

impact on economic growth in Africa. Empirical analysis based on historical public finance data for the US provides strong support for the model developed by Casalin, Diab & Hallett, (2020). The issues are particularly relevant for those countries that do not have a modern and efficient tax collection system such as countries in SSA.

Demachi's (2022) enquiry into African sovereign debt financial dominance over development found that debt accumulation triggers international skepticism against debt sustainability. Nagou, Bayale and Kouassi (2021) on robust drivers of public debt in Africa: Fresh evidence from Bayesian model averaging approach, adopted a BMA approach applied to data of 51 African countries for the period 1990 to 2018. Tested set of twenty-seven regressors, those reflecting international financial and institutional conditions and internal economic prospects tend to receive high posterior inclusion probabilities. Further, the authors explored the effect of the repressors on public debt through fixed effects (FE) and system GMM estimators. Results reveal that, foreign aid, fiscal deficit, trade openness, military expenditure, interest and exchange rates, debt-service, domestic credit, government stability index, political regime type and socio-economic crises are the main and robust drivers of debt accumulation in African countries. Ntekpere and Olayinka (2020) examined the effect of tax revenue on public debt and capital expenditure in Nigeria using OLS regression. The study found that tax revenue has effect on public debt and capital expenditure in Nigeria.

Spyrakis and Kotsios (2021) investigated public debt dynamics through the interaction with national income and fiscal policy. They used bilinear difference equation system to develop models on the dynamic equations of national income and sovereign debt. They found new method for the implementation of fiscal policy, a feedback control of the economic system, and stressed its consequent policy implications for interaction of public debt and GDP. The study of Oyinlola *et al* (2020) on external debt, investment, economic performance in SSA exploited GMM on a panel of 26 SSA countries from 1999 to 2014. They discovered that growth effect of external debt and inflation was negative while it was found to be positive for investment and trade openness.

Kiminyei (2019) empirically investigated the relationship among Kenyan public debt, tax revenue and government expenditure. VECM, Cholesky forecast error variance decomposition, and a dynamic forecast was applied on data from economic surveys of the Kenya National Bureau of Statistics over 1960 and 2011. The results indicated that public debt and government expenditure deviations of the long run equilibrium are corrected in the next period compared to tax revenue equation.

Kéïta and Hannu (2021) in their study found that both corruption and tax burden deteriorate total factor productivity, but that an increase in tax burden mitigates the negative effect of corruption. The study used panel data from 90 countries for the time span of 1996 to 2014. Halkos, Papageorgiou, Halkos and Papageorgiou (2020) in their study on public debt games with corruption and tax evasion developed a model and tested it with Nash and Stackelberg differential game. The study found sufficient condition for the existence of recurring policies and the steady state of the public debt when considered as a stock. These are not SSA studies.

Teupe (2020) worked on Keynes, inflation, and the public debt: "How to pay for the war" as a Policy Prescription for Financial Repression. The study adopted descriptive method of analysis. The study found possibility of using inflation for driving down real interest rates of public bonds to reduce the burden of debt. Again, Ikram Uddin *et al* (2019) studied the impact of corruption on exchange rate through empirical evidence from panel data. The study used time series panel data from 2002-2016 on Pakistan and India. Data was sourced from Asian Development Bank, Transparency International US and World Economic Indicators. Data were analysed with panel unit root test and panel regression. Exchange rate, corruption perception index and foreign borrowings were found to have significant positive impact on real exchange rate.

Ofori, Obeng and Mwinlaaru, (2021) researched the effect of exchange rate volatility on tax revenue performance in SSA. They used panel ADRL technique on macro data spanning 1984 to 2017 for 21 countries. Empirical evidence showed exchange rate volatility is directly harmful to tax revenue performance, and indirectly through trade openness. Tarawalie and Jalloh (2021) in their empirical analysis of the determinants of capital flight in post war Sierra Leone revealed that real effective exchange rate, corruption and external debt are the main determinants of capital flight in Sierra Leone.

Efuntade Efuntade and Akinola, 2020 discovered that tax revenue has significant effect on government expenditure in Nigeria from their study on tax revenue and its effect on government expenditure in Nigeria. The study tested the collected data by using OLS regression model. Data on total expenditure, PPT, VAT, CIT and PIT were extracted from CBN Statistical Bulletin and National Bureau of Statistics. The findings show that tax revenue has significant effect on government expenditure in Nigeria. The findings contradict Babu, Pantaleo and Ndanshau's (2020) findings on the study of econometric analysis of the impact of taxes on private investment in Sub-Sahara Africa using One-Step Difference GMM, which reported that CIT and VAT have significant but negative effect on private investment. Credit to private sector was found to be statistically significant; its effect is unexplainably negative and inconsistent with economic theories. The study found no evidence, on the impact of personal income taxes, real GDP growth rate, nominal exchange rate and inflation rate on private investment. Both studies did not cover debt, and the initial study was based in Nigeria.

The combination of variables tested in this study is not exhaustively covered in the empirical literature reviewed. This study's variables cover the relevance of tax revenue in long term debt reduction, and how tax revenue affected the repayment of long term debt in SSA. While previous studies basically related debts and taxes to economic growth,

3. Methodology

Ex-post facto research designwas adopted in testing and analyzing a dynamic panel estimated with system General Method of Movements (GMM) data set for this study. Dynamic panel data was adopted because it uses lag of the regressors on the data set to eliminate weakness. It is most applicable to this study. The research design allowed observation of multiple phenomena obtained over several time period of the data set. Therefore, *ex-post facto* research design was considered suitable for this study since it disallowed manipulation of the independent variable because the event had already occurred.

The study employed dynamic panel data analysis with system GMM because the variables were converted to their lagged term. This panel data analytical method allows data to be subjected to necessary tests to determine the effect of previous period over time and across periods to establish times series (t), where $T > 1$ along and cross period (n); where $N > 1$ with total observation from 1990 to 2020.

The specified models were evaluated through second order statistical estimation of the results of coefficients and *p-value* which signifies the explanatory power of model's ability to predict the impact of tax revenue on debt financing in SSA. The J-statistic was used to test the statistical significance of the coefficients of individual regression model at 1%, 5% and 10% levels of significance, while aggregate combination of impact of tax revenue on debt financing was calculated using Arellano & Bond (1995) test; developed by Arellano & Bover (1991).

Variable Identification and Model Specification

y_2= External Long Term Debt Stock (ELTDS)
x_1= Custom, Import and Export Duties (CIED)
x_2= Taxes on Product (TXP)
x_3= Taxes on Goods and Services (VAT)
m_1= Inflation (INF)
m_2= Exchange Rate (EXR)
m_3= Corruption (CRP)

$$LELTDS_{it} = \alpha_0 + \beta_1 LELTDS_{it} + \beta_1 LCIED_{it} + \beta_2 LTXP_{it} + \beta_3 LVAT_{it} + \varepsilon_{it} \dots\dots\dots\dots\dots \text{ Model 1}$$
$$LELTDS_{it} = \alpha_0 + \beta_1 LELTDS_{it} + \beta_1 LCIED_{it} + \beta_2 LTXP_{it} + \beta_3 LVAT_{it} + \beta_4 LINF_{it} + \beta_5 LEXR_{it} + \beta_3 LCRP_{it} + \varepsilon_{it} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \text{ Model 2}$$

4. Results, Data Analysis and Discussion

4.1. Regression Results

Variable	Model 1				Model 2			
	β	t-stat	ε	ϱ	β	t-stat	ε	ϱ
LELTDS (-1)	0.827	0.040	20.60	*0.000	0.809	0.063	12.801	*0.000
LCIED (-1)	0.038	0.019	2.006	**0.045	0.033	0.019	1.755	**0.080
LTXP (-1)	0.038	0.012	3.153	*0.002	0.039	0.011	3.407	*0.001
LVAT (-1)	0.015	0.020	0.740	***0.460	0.028	0.017	1.675	**0.095
INF					0.030	0.017	1.748	**0.081
EXR					-0.029	0.053	-0.547	***0.585
CRP					-0.922	3.682	-0.250	***0.802
J-Stat (Prob)	15.85 (0.726)				22.862 (0.154)			
Normality Test	0.378				0.28			
AR(1) AR(2)	0.997 NA				0.998 0.999			

Dependent Variable: LELTDS Significance: *1%5% ***10%**
Source: Researcher's extract from output of statistical analysis (2022)

Interpretation

Evidenced from the probability value of the J-statistics, the study established that models 1 (ϱ-value = 0.726) and 2 (ϱ-value = 0.154) are valid as the ϱ-values are greater than the chosen significant level of 10%. Hence, the study confirmed that with a probability of 10% at 90% confidence level, the data sets used in this analysis are valid. The Arellano–Bond (1995) tests revealed no autocorrelation for both the first order and the second order. While for the AR(1) in first differences, the Arellano–Bond test did not reject the null hypothesis for both models (Model 1: ϱ-value = 0.997 > 0.05; Model 2:ϱ-value = 0.998 > 0.05), as expected. In the case of AR(2) in first differences, the null hypothesis stands for model 2 (Model 2: ϱ-value = 0.999 > 0.05) which means that there is no presence of serial correlation in model 2; while the test is not applicable for model 1.

Thus, the explanatory model will take the following expression:

$$LELTDS_{it} = 0.827LELTDS_{it-1} + 0.038LCIED_{it-1} + 0.038LTXP_{it-1} + 0.015LVAT_{it-1} \ldots \text{ Model 1}$$

The result of the regression analysis for model 1 as presented in Table 4.1 with all the coefficients being positive and all the probability values of the explanatory variables being less than the chosen significance level at 10% proved that a year lag of: LELTDS (β = 0.827; ϱ-value = 0.000 < 0.01), LCIED (β = 0.038; ϱ-value = 0.045 < 0.05), LTXP (β = 0.038; ϱ-value = 0.002 < 0.01) positively and significantly affect LELTDS while LVAT (β = 0.015; ϱ-value = 0.460 > 0.01) effect is insignificant. The coefficient values reflected that a change in LCIED would yield 82.7% change in LELTDS; a change in LTXP would result to 3.8% in LELTDS while LELTDS would change by 3.8% because of a change in LVAT.

Decision

At a significance level of 10% and degree of freedom of 90, the J-statistics is 15.85 and ϱ-value of 0.726 which is greater than the chosen significance level. This established the validity and thoroughness of the model. Likewise, based on the probabilities of each of the measures of the explanatory variable which are lower than the chosen significance level except LVAT which is greater than 10%, and weighing the significance of the effect of the individual variables, this study decided that LCEID and LTXP significantly affected LELTDS while LVAT insignificantly affected LELTDS of Sub-Saharan African countries. Thus, from the probability of J-statistics which confirmed the validity and exhaustiveness of the model, the study rejected null hypothesis one, which

means that "Tax revenue has significant effect on External Long Term Debt Stock of SSA Countries"

Likewise, model 2 analyzed with controlling variables INF, EXR and CRP as shown in the analyzed output can be expressed thus:

$LELTDS_{it} = 0.809LEGPD_{it-1} + 0.033LCIED_{it-1} + 0.039LTXP_{it-1} + 0.028LVAT_{it-1} + 0.030INF_{it-1} - 0.029EXR_{it-1} - 0.922CRP$..........Model 2

Observed from Table 4.1 the result of the regression analysis of model 2 is that the coefficients are positive except EXR and CRP with negative coefficients. The probability values of the explanatory variables are less than the chosen significance level at 10% except EXR and CRP. This verified that a year lag of: LELTDS (β = 0.899; ϱ-value = 0.000 < 0.01), LCIED (β = 0.033; ϱ-value = 0.080 < 0.1), LTXP (β = 0.039; ϱ-value = 0.001 < 0.05), LVAT (β = 0.028; ϱ-value = 0.095 < 0.1), INF (β = 0.030; ϱ-value = 0.081 < 0.1), EXR (β = -0.029; ϱ-value = 0.585 > 0.1) and CRP (β = -0.922; ϱ-value = 0.802 > 0.1), positively and significantly affected LELTDS while EXR and CRP negative and insignificantly affected LELTDS. The coefficient values reflected that a change in LCIED would yield 80.9% change in LELTDS; a change in LTXP would result to 3.3% in LCIED while LELTDS would change by 2.8% because of a change in LVAT. The model is positively moderated by 0.3% INF; and negatively moderated -2.9% and -9.22% by EXR and CRP respectively.

Decision

With J-statistics having a value of 22.862 and ϱ-value of 0.154 which is greater than the chosen significance level of 10%; the model is confirmed valid and exhaustive. Similarly, the probability of each of the measures of the explanatory and the controlling variables are lower than the chosen significance levels of 5% in LTXP; and greater than 5% but less than 10% in LCIED, LVAT and INF but greater than 10% for EXR and CRP. In appraising the significance of the impact of the individual variables; therefore, this study decided that LCIED, LTXP, LVAT and INF positively significantly affected LELTDS while EXR and CRP negatively and insignificantly affected LELTDS of SSA countries.

From the probability of the J-Statistics confirming the validity and exhaustiveness of the model, therefore, the study affirms that exchange rate, inflation and corruption significantly control the effect of tax revenue on External Long Term Debt Stock of Sub-Saharan African countries. Thus, the study rejected null hypothesis and accepts the alternate hypothesis two which holds that "Inflation, exchange rate and corruption have significant control on the effect of tax revenue on External Long Term Debt Stock of Sub-Saharan African countries"

Discussion of Findings

The result of analysis of models 1 and 2 which investigated the effect of tax revenue on external long term debt stock of SSA countries controlled by INF, EXR and CRP in model 2; and found that both models are confirmed to be valid from the probability values of J-statistics. The regression output showed that a year lag of CIED, TXP and VAT positively and significantly affected debt financing of external long term debt stock (ELTDS) of SSA countries. Thus, thus study rejected the null hypothesis one and accepts the alternate hypothesis that tax revenue has significant effect on External Long Term Debt Stock of Sub-Saharan African countries. Previous year taxes affected debt financing in the preceding year. This result further aligned with the a priori expectation.

However, when the variables were controlled with INF, EXR and CRP in model 2, the result was varied. While all the coefficients were positive and significant for CIED, TXP VAT and INF, EXR and CRP have negative and insignificant effect on ELTDS of SSA countries. The study then rejected the null hypothesis that inflation, exchange rate and corruption have no significant controlling effect on tax revenue and External Long Term Debt Stock of SSA countries and accept the alternate hypothesis that exchange rate and corruption have significant controlling effect on tax revenue and External Long Term Debt Stock of SSA countries. Revenue determines the ability to service and pay off debts, thus, it is a major consideration by the lending agencies. It is a major factor in the determination of ability to finance repayment of long term debts.

This result agrees with prior studies of Efuntade *et al,* (2021), Ehikioya *et al,* (2020), Omodero *et al,* (2020) who found positive impact on debt servicing, Lelya and Ngaruko, (2021), Spyrakis and Kotsios, (2021); Ntekpere and Olayinka, (2020), and Nguyen *et al,* (2019). On the other hand, Ademola *et al.* (2019), Oyinlola *et al.* (2020), and Sani and Yahaya, (2021); discovered negative effect with controlling variables. From the foregoing, the study found that increase in debt financing worsen inflation and corruption, while other resulted show that public external debt had a significant positive correlation with inflation; Ofori *et al.* (2021). On the contrary Manasseh *et al.* (2022), Gupta and Liu (2020); Gachunga & Kuso, (2018), Olawale *et al.* (2018) Tarawalie and Jalloh, (2021), Lelya and Ngaruko, (2021), and Akintoye *et al.* (2019) found that stable political stability among others improved tax revenue needed to finance long term debt.

5. Conclusion and Recommendations

The study concluded that external long term debt stock of SSA countries is affected by Custom, Import and Export Duties (CIED), Taxes on Product (TXP) and Taxes on Goods and Services (VAT). The outcome was slightly differed when moderated, LELTDS positively and significantly moderated while EXR and CRP negatively and insignificantly moderated LELTDS of SSA countries. It was therefore recommended that;

1. Government of SSA nations ought to be strategic in maintaining sustainable external long term debt stock portfolio as the present debt to tax revenue ratio of SSA countries are below the world benchmark which is unsustainable and adversely affect the economy.
2. This is globalization period; businesses are conducted across boarder; and therefore; policymakers should ensure tax policies are implemented to accommodate changes such that paying tax will be easy across borders.

6. Contribution for Future Research

This study contributed to the scarce studies on long term debt in relation to tax revenue. provides further information and created a platform for further research work in the area of public debt, financing and reduction of debt accumulation in view of other forms of public debt.

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