
Fiscal Sustainability and Remittance in Sub-Saharan Africa: A GMM Approach

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ABSTRACT

The few existing studies on the impact of remittances on fiscal sustainability have been observed to be country-specific. This is an attempt to improve on that by examining the impact of remittances on fiscal sustainability using sub-Saharan African countries as a case study with a study that cuts across several countries. The scope of the data of the study ranges between 2006 and 2019. The study adopted the Panel Generalized Method of Moments (GMM) for the empirical analysis of the study. The model is said to cater to the problem of endogeneity. The study makes use of four different models for data estimation. The study found out that foreign direct investment has a positive and statistically significant impact on remittance in Sub-Saharan African countries. The findings of the study have also revealed that remittance has a positive and statistically significant impact on the tax revenue as a ratio of the GDP in sub-Saharan African countries. The study also recommended policies such as an expansionary fiscal policy to stimulate household consumption expenditure which will in turn have a positive effect on tax revenue. The study also recommended that government should attract more remittances to foster higher and inclusive growth in the migrant's home countries through investment in government-sponsored bonds and the stock market.

KEYWORDS: Remittances, Fiscal sustainability, GMM, Tax Revenue

Introduction

The number of people that live abroad grows by the day as people continue to search for a greener pasture. On a global level, the international migrants have increased in the last five decades; where the total estimated 272 million are reported to be living in a country other than their original countries or countries of birth as of 2019 as the population was 119 million higher than in 1990 (when it was 153 million). This number is also over 3 times the estimated 84 million in 1970 (World Migration Report, 2020). It was also mentioned in the World Migration Report (2020) that International remittances have moved from an estimated 126 billion in the year 2000 to 689 billion in the year 2020 as this supports the suggestion that international migration is an economic development driver. While it is widely recognized that migration can have both negative and positive social, cultural, and economic implications for countries of origin, remittances are the least controversial and most tangible link between

migration and development. Remittances can be said to be the earnings international migrants send to family members in their country of origin and represent one of the largest sources of financial flows to developing countries. The World Bank (2015) has estimated that the international stock of migrants at 247 million. And as an undiscounted capital, global remittances were calculated to have hit \$583 billion in 2014 as the developing countries were estimated to have received \$436 billion (World Bank, 2015). There had been a dramatic increase in international capital flows to the developing countries in the past decade. The flow to Africa was spectacular, having overtaken official development assistance (ODA) and portfolio equity and remains the most stable source of all external finance in 2015 (Africa Economic Outlook, 2016).

Increasing financial weight and stability of remittances to Sub-Sahara Africa has also been a serious argument among researchers and policymakers. The work of Ratha (2003) which shows that economic growth is a function of remittance under-investment multiplier, significantly lend credence to this debate. Also, Adams & Page (2005), Lim & Hem (2017) among others, recognize that remittance plays a vital role in the reduction of poverty. Meanwhile, the work of Chami, Fullenkamp, & Jahjah (2003), Zuniga (2011), and Ahamada & Coulibaly (2013) is a significant turning point in the debate. These authors argue that decades of remittances had reduced long-run growth. It has also been pointed out by several kinds of literature that the quality of non-financial institutions such as the control of corruption, political stability, respect of rule of law, democratic accountability, and so on is crucial for the development of the financial markets (Roe & Siegel 2008) and the economy as a whole (Orayo, 2016).

Statement of the problem

Given the magnitude of its importance, remittance continues to attract the attention of researchers and high-level domestic and international policymakers as the World Migration Report (2020) mentioned that a total of 272 million people live in countries other than their countries of birth. There is now substantial literature that has documented the positive welfare-enhancing benefits of remittances for the recipient households. Remittances allow for investments in health care and education, contribute to the alleviation of poverty, and are responsible for minimizing consumption volatility, among others (De Haas, 2005). However, in contrast to the well-documented impact of remittances on recipient households, the role of remittances in development and growth is still not well understood. On one side, the proponents of remittances as a development tool point at the evidence suggesting that remittances are often used for investment purposes and also to facilitate financial development. On the other side, some authors have argued that remittances may be detrimental to economic growth. Some of the arguments are based on empirical evidence, showing that remittances fuel inflation, reduce labor market participation, and may affect the tradable sector by causing a real exchange rate appreciation.

However, only a limited number of studies have tested a direct relationship between remittances and fiscal sustainability such as debt, and these studies have typically provided inconclusive results. The only notable study in this area seems to be that of Abdih et al. (2012) sponsored by the IMF. This research attempts to fill the gap in the existing literature of the macroeconomic impact of remittances fiscal sustainability using 42 sub-Saharan countries as a case study.

While the broad objective of this study is to investigate the impact of remittances on fiscal sustainability using sub-Saharan African countries as a case study, specifically, the study is

set out to (i). assess the determinants of remittance in sub-Saharan Africa; (ii). examine the impact of remittance on each demand components (household consumption, imports, or private investment) and (iii), investigate the fiscal impact of remittance on tax (sales and trade) revenue ratios. The selected African countries used for the analysis of this study include Nigeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Congo, Malawi, Mozambique, Ethiopia, Zimbabwe, Mauritius, Madagascar, Niger, Gambia, Egypt, Equatorial Guinea, Uganda, Lesotho, Ghana, Guinea Bissau, Namibia, Kenya, Tunisia, Libya, Morocco, Republic of the Cote d'Ivoire, South Africa, Malawi, Central African Republic, Mali, Rwanda, Senega, Liberia, Chad, Swaziland, Cape Verde, Djibouti, Gabon, Sierra Leone, and Zambia.

Theory and Review of Literature

Fiscal sustainability theory

The theoretical literature for fiscal sustainability is based on three hypotheses which comprise the Neoclassical and Keynesian propositions as well as the convergence hypothesis. The convergence proposition is couched infinite, initial, and infinite horizon outlook in line with the convergence path with which the public debt ratio also threads (Langenus, 2006). Both the first version which was started by Domar (1994) and which also predicts the convergence of debt ratio to a finite value and the second version- which is embedded in the study of Buiters (1990) and *Blanchard*, Chouraqui, Hagemann, and Sartor (1990) also requires a convergence to an initial level while the third and the last version popularized by Blanchard et al. (1990); implies that the debt ratio converges to zero.

Also, the sustainability of fiscal policy can be explained under the conditions to which fiscal policies are managed by observing existing fiscal rules (Marnefee, Aarle, Van De Wielen, and Vareeck, 2011). It is from this thought that the motivation for both the (Neo) Classical and Keynesian propositions relate. As related by Marnefee et al. (2011), fiscal rules can be categorized into two viz: (i) fiscal rules that primarily aim at restricting government spending, budgetary deficits, and government debt to safeguard fiscal sustainability. The fiscal rules propagated by (neo) classical principles belong to this category. (ii) Fiscal rules that primarily aim at stabilizing macroeconomic fluctuations.

The aforementioned rules of fiscal sustainability are guided by the short-run (new) Keynesian principles of fiscal management. Neoclassical economics, in its characteristic nature depends on the full employment equilibrium and symmetric market information without giving room for policy impulses from the government to persuade policymakers to pursue a balanced budget strategy. In agreement with the Keynesian propositions on the heel of the 1930's Great Depression, cyclical revenues and expenses were put forward to replicate automatic market stabilization policies at the time of recession and when a balanced budget was recorded. This proposition is based on the Keynesian notion that market forces alone cannot be trusted to solely regulate the market and thus, progressive tax rates and unemployment benefits are other means through which the government also controls the market. The Keynesian rule proposes a short-term intervention to the fiscal policy where diverse policy mix which also includes bail-out measures are adopted during the recessionary period to sustainability (Marnefee et al., 2011).

Conceptual Review

Remittances can be conceptualized as the inflow of resources from residents of a country residing in another country to the domestic country. In the words of Yang (2011), he defined remittances as household income which is received from abroad, resulting mainly from international migration of workers.

As conceptualized by Schick (2005), fiscal sustainability encompasses government solvency, continued stable economic growth, stable taxes and intergenerational fairness. This view shows the need for the government to strive at all times in providing mechanisms that will ensure the fiscal position of any economy remains afloat. European Union (2012) conceptualized fiscal sustainability as the ability of the government to assume the financial burden of its debt in the future. In essence, it implies, avoiding an excessive increase in government liabilities, a burden on future generation and at the same time ensuring that the government is able to deliver the necessary public services, including the necessary safety net in times of hardship (European Union, 2012).

Empirical Review

Quite a number of related studies have been carried out in this area among which are reviewed in this section with a focus on the methodologies and the findings of the study. For instance, Okolo C. (2017) investigated the impact of remittances on fiscal sustainability in Nigeria. The study has used an annual time series data which ranges between 1997 and 2014. The Ordinary Least Square was adopted as the study has found out that remittances have a significant positive impact on fiscal sustainability in the long run. An increase in the level of remittances will improve the sustainability of fiscal policy as the results are in line with the earlier findings.

Hussin, Jauhari, and Muszafarshah (2012) carried out an empirical study between fiscal sustainability and Gross Domestic Product (GDP) in Malaysia with the use of cointegration tests analysis adopting an Autoregressive (VAR) framework coupled with the Vector Error Correction Modeling (VECM) technique for the periods that range between 1970 and 2009. They found out in their study that the macroeconomic performance on the output in Malaysia was sustainable and thus further established that the levels of fiscal sustainability were sustainable in Malaysia. A country that is doing well in the area of investment, having inflation controlled to a level that stimulates demand for goods and services, maintaining a reasonable amount of public debt among others will experience growth in output.

Tapsoba (2012) in his study while investigating whether national numerical fiscal rules (FRs) really shaped fiscal behaviours in 74 developing countries over the period 1990 to 2007, his study found out as he controlled for self-selection problem in policy evaluation, that the effect of FRs on structural fiscal balance is significantly positive, robust to a variety of alternative specification and varies with the type of FRs. In terms of policy implication, the study suggested that the introduction of rule-based fiscal policy frameworks remain a credible remedy for governments in developing countries against fiscal sustainability.

Lartey (2011) examined the nexus between remittances and per capita growth, and investigated whether the impact of remittances on growth is through capital accumulation or other mechanisms. The study adopted data from sub-Saharan African countries and dynamic empirical models, the findings of the study revealed that a positive relationship exists between remittances and growth. It was further revealed that findings also reveal threshold

values for two main indicators of financial development, above which the total effect of remittances on growth is positive.

Ogbole, Amadi, and Essi (2011) investigated the existence of the relationship between fiscal policy and economic growth in Nigeria for the period of 1970 to 2006. They employed Johansen's cointegration test and Granger causality test. The results of their study showed that there exists a causal relationship between the fiscal policy and economic growth and a unidirectional causality running from fiscal policy variables to economic growth variable. A fiscal instrument such as the public or external debt help boosts the economy provided the loans are judiciously used. There is also a need for the government to spend on the key sectors of the economy such as the agricultural sectors as well as the sectors that help on the general welfare of the people the health sector inclusive. Also, Oyeleke (2013) investigated fiscal policy sustainability in three West African Monetary Zone (WAMZ) countries from 1980 to 2010. The study employed econometric techniques to investigate the sustainability of fiscal policy. The findings revealed that fiscal policy was weakly sustainable in those countries and the speed of adjustment of government revenue to government expenditure was relatively high in Nigeria compared to Ghana and Guinea.

Methodology

Data Source

The analysis is conducted using an annual and a panel data over the period 2006 to 2019 for 42 African countries. The data on the Foreign Direct Investment, net inflows (% of GDP), Household final consumption expenditure, GDP per capita (constant 2010 US \$), Personal remittances received (% of GDP) and Tax Revenue (% of GDP) are all sourced from the World Bank (2020) database.

Model Specification

The model of the study is patterned after that of the IMF working study, Abdih et al. (2012). The study estimates the remittance channel in which external shocks are transmitted to the domestic fiscal sector. The study makes use of four different sets of equations for the estimation of the data.

A. Remittances and foreign shocks

In line with the explanation above, the empirical specification takes the following form;

$$\log(R_{i,j}) = \alpha + \theta_1 Y_{i,t} + \theta_2 Y_{i,t}^* + X'_{i,t} \beta + u_t + \eta_t + \varepsilon_{i,t} \quad 3$$

Note; R is either the real value of per capita remittances in U.S. dollars or the remittances scaled by the receiving country GDP. Y and Y* represents the per capita income in the receiving and sending country, respectively, expressed in log terms, and X is a matrix of control variables that includes the other determinants of remittances discussed above. u_t and η_t represents the country and year fixed effects, respectively.

B. How remittances are spent

$$D_{i,j} = \alpha + \theta_1 R_{i,t} + X'_{i,t} \beta + u_t + \eta_t + \varepsilon \quad 4$$

Note, D represents the logarithm of the GDP share if each alternative private demand component (household consumption, imports, or private investment decision), where R in the equation is the log of the ratio of net remittance inflows to the GDP, and X is a matrix of the control variables for each component of private demand. Note; θ_1 captures the elasticity of the private demand component concerning remittances, and it is expected to have a positive sign.

C. How Tax Revenues React to Private Demand Components.

$$T_{i,j} = \alpha + \theta_2 D_{i,t} + X'_{i,t} \beta + u_t + \eta_t + \varepsilon \quad 5$$

Note that; in equation 5 above, T represents each of the tax revenue ratios (in log) subcategory and D the corresponding demand component (tax base). Also, θ_2 represents the elasticity of the tax revenue ratio concerning each component of the domestic demand, and X is the matrix of the basic control variables.

Remittances and the Tax Revenue Ratios: The Reduced Forms Estimates are stated below.

In line with the above, the reduced form of the equation is therefore specified as follows;

$$T_{i,j} = \alpha + \theta D_{i,t} + X'_{i,t} \beta + u_t + \eta_t + \varepsilon \quad 6$$

Note; T, R, and X represent tax revenue ratios, net remittances inflows, and the matrix of the control variables, respectively.

Econometric Technique

This study adopts the generalized method of moments (GMM) estimators developed for dynamic models of panel data introduced by Holtz-Eakin et al. (1990), Arellano and Bond (1991), and Arellano and Bover (1995). The estimator corrects for the endogeneity in the lagged dependent variable and provides consistent parameter estimates even in the presence of endogenous right-hand-side variables. It also allows for individual fixed effects, heteroskedasticity, and autocorrelation within countries (Roodman, 2009). The Arellano-Bover/Blundell-Bond estimator augments Arellano-Bond by making an additional assumption that the first differences of instrument variables are uncorrelated with the fixed effects. This method allows more instruments and hence leads to improved efficiency.

Estimation and Empirical Results

The need to carry out a unit root test to determine the suitable estimation technique has been suggested in the literature.

Table 1: Panel Unit Root Test

A prerequisite for implementing the Pedroni (2004) panel unit root test is to establish that the variables are stationary. The results of the tests for unit roots (stationarity tests) are summarized in the table below.

Panel Data	Levin, Lin and Chu(LLC) test (Common Unit Root process)			
	T stats.	P-values levels	@ T stats	P-values @ 1 st difference
REM	-3.23358	0.0006**	-5.21433	0.0000**
TXR	-1.49377	0.0676	-6.53708	0.0000**
PGDP	-0.25773	0.3983	-3.53653	0.0002**
EXR	3.31022	0.9995	-3.31212	0.0005**
FDI	-4.03740	0.0000**	-8.11449	0.0000**
HS	-0.34286	0.3659	-8.03324	0.0000**

Note: ** denotes rejection of the hypothesis of non-stationarity at 5% significance level.
Source: Author's computation, 2020

The result as contained in the Table 1 and on the basis of the Levin, Lin and Chu t-statistical test, shows the variables are stationary at either levels or first difference at 5% level of significance, we can therefore reject the null hypothesis that there is unit root while we accept the alternative hypothesis of no unit root. All the variables are all stationary.

Table 2: Panel Cointegration Test

The panel cointegration test is carried out to check whether the variables converge in the long run. The Pedroni (2004) heterogeneous panel cointegration test is used.

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	-2.312969	0.9896	-3.577276	0.9998
Panel rho-Statistic	4.889574	1.0000	4.360245	1.0000
Panel PP-Statistic	-5.848740	0.0000	-15.04802	0.0000
Panel ADF-Statistic	-4.627085	0.0000	-4.944903	0.0000
Alternative hypothesis: individual AR coefs. (between-dimension)				
	Statistic	Prob.		
Group rho-Statistic	6.063848	1.0000		
Group PP-Statistic	-22.10010	0.0000		
Group ADF-Statistic	-4.051985	0.0000		

Source: Author's computation, 2020

From the cointegration result in table 2, the p. values associated with 6 out of the 11 statistics is less than 5 percent. Hence, implying that the variables are co integrating.

Table 3: GMM Estimates (2006-2019).

Variable	Dependent Variable:											
	REM.				LHS				TXR			
	Effect.	Fixed	Effect.	Random	Fixed Effect	Random	effect	Random	Fixed Effect	TXR	Effect	Random
	A				B				C			
	Est.	Prob.	Est.	Prob.	Est.	Prob.	Est.	Prob.	Est.	Prob.	Est.	Prob.
C	-16.8*	(0.00)	-10.8*	(0.01)	21.64*	(0.00)	10.47*	(0.00)	-11.4	(0.31)	-8.69	(0.36)
LPGDP	2.57*	(0.00)	1.61*	(0.00)	0.001*	(0.00)	1.85*	(0.00)	3.97*	(0.002)	3.56**	(0.01)
EXR	0.47	(0.31)	0.57*	(0.04)								
FDI	0.01	(0.85)	0.01	(0.81)	0.01	(0.311)	-0.004	(0.59)	0.004	(0.96)	0.001	(0.98)
REM					0.018	(0.23)	-0.01	(0.54)	0.26***	(0.06)	0.27***	(0.05)
LHS												
R ²	0.8		0.73		0.26		0.72		0.87	(0.64)		
DW	3.4		0.71		0.66		0.69		0.79		0.21	
Hausman Test		(0.73)				(0.011)				(0.91)		

Note: *, ** and *** shows statistical significance at 1, 5, and 10%. *Author's computation, 2020*

For model A, the Hausman test accepts the null hypothesis that the individual country and time-specific effects correlate with other explanatory variables since the p-value is not significant at both 1 percent and 5 percent levels. Therefore, this signals we adopt random effects. It implies that random effects are preferred.

For Model B, the results of the Hausman test in Table 3 above show it is significant at both 1 percent and 5 percent levels. Therefore, the Hausman test rejects the null hypothesis that the individual country and time-specific effects do not correlate with other explanatory variables. This is evidence that using the random effect may be problematic for the study. Therefore, the result of the fixed effects model is appropriate.

For Model C, going by the insignificance of the p. value of the Hausman test in table 3 above, we accept the null hypothesis that the individual country and time-specific effects do not correlate with other explanatory variables. Hence, we adopt the results of the random effects which are considered appropriate for the study by the Hausman test.

Table 4: GMM Estimates for model D.

Variables	Dependent Variable:			
	TXR Fixed Effect		TXR Random Effect	
	Est.	Prob.	Est.	Prob.
C	-1.84	(0.86)	0.88	(0.26)
LHS	0.75	(0.12)	0.07**	(0.04)
REM	0.32	(0.14)	0.03*	(0.00)
EXR	-0.003	(0.54)	0.007	(0.88)
FDI	0.02	(0.8)	0.004	(0.39)
R2	0.87		0.85	
DW		3.15		0.63
Hausman Test				0.07

Note: *, ** and *** shows statistical significance at 1, 5, and 10 percent level of significance.

Source: Author's computation, 2020

The results of the fixed and random effects show similarity as remittance has a significant impact on tax revenue in both cases. We, therefore, consider the result of the Hausman test to ascertain the preferred model.

The results of the Hausman test in table 4 above suggest that we make use of the random effects. Since the test shows non-significance. The result of the random effects in table 4

shows that remittance (REM) has a positive and statistically significant impact on the tax revenue in the sub-Saharan African countries. The result is consistent with the economic a priori expectation at 5% significant level. The results further show that a unit increase in the level of remittance will induce an increase in the growth of the tax revenue by 0.03%. Since the rate at which the sub-Saharan African people migrate has increased, it is logical to have a situation of an increase in the tax revenue. Also, as the migrants abroad remit more money, the revenue through the direct tax will definitely increase.

The results also show that household spending (HS) has a positive and significant relationship with tax revenue. The result on the exchange rate (EXR) and the one of foreign direct investment (FDI) are not significant as shown in the table 4 above. The result on the adjusted R-squared shows that 85% of the change in the dependent variable (TXR) is explained by the combination of the independent variables of the model of the study.

Discussion of Results and Implications

Remittance which is the main variable of the study alongside the tax revenue shows a positive significant relationship with the level of tax revenue as the result implies that more revenue will be generated from tax when the share of the remittance in GDP increases. Also, the findings of the study are in line with the findings of the previous findings. Abdih et al. (2009) which examined the impact of remittances on the sustainability of government where he made use of the Lebanese fiscal data. The study found out that the inclusion of remittances in the traditional analysis of the sustainability of the debt alters the amount of fiscal adjustment required to place debt on a sustainable path. They also put forward that one of the ways remittances can affect fiscal sustainability is the increase of the tax base.

The result is contained in table 4 under the random effect that shows remittance has a significant positive effect on tax revenue. The result shows that a 1% increase in the level of remittance will lead to 0.03% in the tax revenue in sub-Saharan African countries. The finding of this study also agrees with the finding of Saddique et al. (2012) carried out on the causal link between remittances and economic growth in Bangladesh, India, and Sri Lanka, by employing the Granger causality test under a Vector Autoregression (VAR). The findings of their study showed that growth in remittance contributes positively to the economies of those countries.

Conclusion

It can be concluded from the findings of the study that remittance is a significant factor in tax revenue in sub-Saharan African countries. The more the remittance inflow, the higher the revenue from the tax.

Recommendation

The study recommends an expansionary fiscal policy to stimulate household consumption expenditure as this is expected to bring about an increment in tax revenue. There is also a need for the government to attract more remittances to foster higher and inclusive growth in the migrant's home countries under-investment in government-sponsored bonds and the stock market. The government should Strengthen remittances-transfer infrastructure, which includes the use of new technologies (especially IT and mobile phones) to channel remittances. The study can be said to be limited given it made use of the fiscal factor to tax alone neglecting other components or public debts.

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