

## International Remittances and Economic Growth in Some Selected Sub-Saharan African Countries: Evidence from Panel Co-integration Approach

Ishaq Saidu<sup>1</sup> & Ali Salisu<sup>2</sup>

### Abstract

---

Remittances is now the largest international flow to Africa. In Sub-Sahara Africa, it grew by 10 percent to \$46 billion in 2018, accounting for about 3 percent of the GDP of the subcontinent. This study analyzes the long run relationship of remittances and economic growth in some selected SSA countries, namely, Nigeria, Ghana, Kenya and Senegal, using annual panel data for the period of 1980-2018. The study employed LLC and IPS panel unit root test, Pedroni and Kao co-integration test to investigate structural and causal relationship between variables. From the long run cointegrating parameter estimates, the results suggest that an increase in remittances, foreign direct investment, trade openness and domestic investment, increases economic growth of SSA countries. Therefore, the study recommends that there is the need for SSA to design policies, programs as well as the institutional reform that will encourage the productive use of remittances.

---

**Keyword:** remittances, economic growth, Panel Co- integration, Sub-Saharan Africa

### 1. Introduction

International remittance took the lead as the highest external inflow to Africa, reaching 82.8 billion in 2018. In some developing countries, international remittances represent a significant part of international capital inflows surpassing Foreign Direct Investment, export revenue, and foreign aid in terms of size and contribution to the economy (World Bank, 2017; Fayissa & Nsiah, 2008). In some instances, international remittances have grown faster than FDI and official development assistances and staying resilient even in times of economic crisis (Kapur 2003; Guilano & Ruiz-Arraz, 2005; World Bank, 2006; Ratha, 2012; World Bank, 2017).

International remittances have grown to become one of the most visible benefits of migration to the developing worlds. People migrate from one place to another in order to improve living condition of their families in their home countries. Remittances consist of goods or financial instruments transferred by migrant living and working abroad to residents of the home economies of the migrants. It is limited to transfer made by workers that had stayed in foreign economies for at least one year while transfer from migrants that are self-employed are excluded (IMF, 1999). Recent financial flows into developing countries in the form of remittances have received renewed attention. Remittances directly or indirectly raise national income, increase consumption, stimulate investment, accelerate the production and creation of jobs and indirectly increase the income of the families who do not receive remittances (Comes et al; 2017). Consequently, inflow of remittances generally lead to reduction in poverty level, acquisition of skills and techniques, improvements in health conditions and improved access to educational and other benefits (Khathalan, 2012). This has huge economic benefit for the origin countries. The benefit from remittances is not one way. Buettner & Rainer (2020) explained that high-income destination countries also benefit from migration in form of increased productivity, skills, innovation, entrepreneurship and tax payment to destination country

International remittance is now one of the most stable and crucial sources of external finance for many low and middle-income countries. Considering the importance of remittances, developing countries have offered various incentives to attract international remittances fund transfer into local savings and investment. International migration has offered an opportunity for developing countries to consider ways of benefiting from their national living and working abroad through the implementations of monetary policies and the adoption of pro-growth strategies to attract optimal remittances to finance their development projects (Adenutsi, 2010).

---

<sup>1</sup>Lecturer, Department of Economics, Baze University Abuja, Faculty of Management and Social Sciences, FCT Abuja Nigeria.

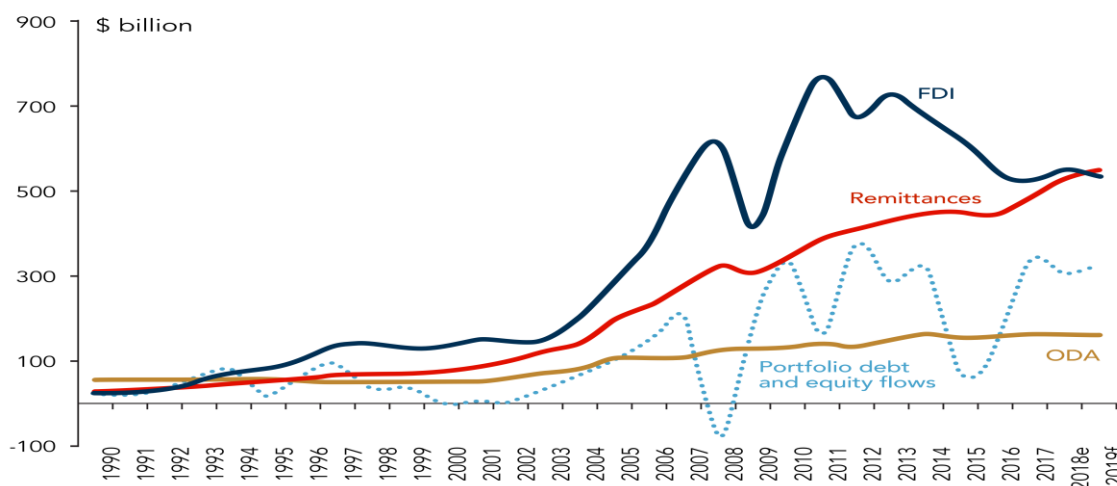
<sup>2</sup>Lecturer, Department of Economics, Faculty of Social Sciences, Bayero University Kano, Nigeria

Remittance flow to Sub-Saharan Africa grew from \$34 billion in 2016 to \$38 billion in 2017, and \$46 billion in 2018. Moreover, the top remittances recipients' countries in Sub-Sahara Africa in 2017 include Nigeria \$22 billion, Senegal \$2.2 billion, Ghana \$2.2 billion, Kenya \$2.0 billion (World Bank 2018). In spite of the above inflows, the top ten remittances recipients' countries as percentage to GDP in SSA are Liberia (27.1%), Comoros (21%), Gambia (20.8%), Lesotho (15.2%), Senegal (13.9%), Cabo-Verde (12.8%), Togo (8.4 %), Guinea-Bissau (8%), Mali (6.9%) and Nigeria (5.6%) (World Bank 2018). This suggests that the share of remittances as percentage to GDP of the high remittance recipients' countries in SSA (Nigeria, Senegal, Ghana and Kenya) is still very low. Therefore, the low share of remittances to GDP of the highest recipients' countries in the region prompted this study to investigate the remittances impacts on economic growth of these countries. The objective of this paper is to determine the impact of remittances on economic growth in some selected Sub-Saharan African countries using Panel Co-integration Approach. This paper is structured as follow. Section two discusses literature reviews and theoretical framework, section three presents the methodology, while section four reports the results & discussion. Finally, section five presents the conclusion and recommendations.

## 2.1 Trends of Remittances Flow to SSA

Since the adoption of IMF-World Bank led Economic Recovery Programme (ERP) that embodied the Structural Adjustment Programme (SAP) by Sub-Saharan African in 1980s, macroeconomic policies and programs in the region have become more liberal and market oriented. This has encouraged and increased the global flow of finance such as Foreign Direct Investment (FDI), Official Development Assistance (ODA), Foreign Aid and International migrant remittances. Xpress Money (2020) reports that over 25 million emigrants from the sub-Saharan region remitted a total of \$46 billion to the region in 2018 and this trend is expected to continue through 2020.

Figure 1: Remittance flows to sub-Saharan African countries, official development assistance, and private capital flows, 1990-2018



Source: World Bank 2019

Official migrants remittances to SSA was \$1.86 billion in 1990 and by 2003, migrants remittances flows to the region had reached \$5.96 billion this rising trend in official remittances flows to SSA continued, reaching \$10 billion in 2005, up to \$21.6 billion in 2008 before dropping slightly to \$20.7 billion in 2009 due to the global financial crisis between 2007 – 2009. Remittances to Sub-Saharan Africa grew from \$34 billion in 2016 to \$38 billion in 2017, and \$46 billion in 2018. Moreover, the top remittances recipients' countries in Sub-Sahara Africa in 2017 include Nigeria \$22 billion, Senegal \$2.2 billion, Ghana \$2.2 billion, Kenya \$2.0 billion (World Bank 2018). In spite of the above inflows, the top ten remittances recipients' countries as percentage to GDP in SSA are Liberia (27.1%), Comoros (21%), Gambia (20.8%), Lesotho (15.2%), Senegal (13.9%), Cabo-Verde (12.8%), Togo (8.4 %), Guinea-Bissau (8%), Mali (6.9%) and Nigeria (5.6%) (World Bank 2018).

In spite of this positive trend SSA remains the least recipients of remittances, receiving only 5 percent of global remittances compared to East Asia and the Pacific (20.7 percent), South Asia (18 percent), LAC (13.7 percent), Europe and Central Asia (11.0 percent) and MENA (7.7 percent). The total remittances received by SSA (\$20.7 billion) as at 1990 which is far less than the official remittances received by any world's top three remittances recipient countries – India (\$49.29 billion), China (\$47.55 billion) and Mexico (\$22.16 billion) (World Bank 2011).

Between 2000– 2005, remittances to SSA rose 55 percent to nearly \$7 billion in comparison to 81 percent increase for all developing countries as a group. The top 10 recipients of remittances as percent of GDP in SSA are: Lesotho (with more than 25%), Cape Verde, Guinea-Bissau, Senegal, Togo, Uganda, Comoros, Swaziland, Mauritius and Kenya (with less than 5%). (Fayissa&Nisah, 2008).In 2018, about 67 per cent of migration in sub-Saharan Africa (SSA) were intra-regional (World Bank (2019)). This contradict the common notion that young people from the region have only strong preference for high income countries.

Table 1.1: Migration pressure across region by 2030

	Ratio of seniors to young*	Change in working population**
Japan	3:1	-6
Germany	3:1	-5
Italy	3:1	-3
Korea, Rep.	3:1	-4
Poland	2:1	-2
China	1:1	-34
Mexico	1:2	13
India	1:2	129
Pakistan	1:3	34
Kenya	1:6	12
Ethiopia	1:5	25
Nigeria	1:7	44
Uganda	1:9	12

World Bank , 2019

World Bank (2017) reported thatduring the global financial crisis in 2009, remittances flow to developing countries fell by about 5 percent, and bounced back within a year. Among other international flows of financial resources, remittances are particularly important because of their volume and relative stability. While foreign direct investment (FDI), official development Assistance (ODA) inflows to SSA have declined after the global financial crisis, remittances rebounded shortly after the crises in 2010 (Ncube and Brixiovia, 2013).

Between 2015 - 2016 the growth rate of remittance trend to developing countries was negative. Remittance flows to SSA declined by estimated 6.1 percent and reached \$33 billion in 2016 because of weak growth performance and policy – related issues in Nigeria. In the same year the high remittances recipients' countries in SSA in volumes were Nigeria \$19 billion, Ghana \$2.0 billion, Senegal \$2.0 billion, Kenya \$1.7 billion. While countries with high percentage to GDP include Liberia 29.6 percent, Comoros 21.2 percent, Gambia 20.4 percent and Lesotho 17.5 percent (World Bank, 2017).

In 2017, after two consecutive years of decline, remittances flow to SSA grew from \$34 billion in 2016 to \$38 billion in 2017 and expected to continue to grow in the years to come. This increase is partly back by a pickup in global economic growth, especially in high-income OECD countries and the rebound in oil prices since July 2017 boosted economic activities in oil-producing countries. Both OECD and oil-producing countries host many Sub-Saharan African migrants. The top remittances recipients' countries in SSA in 2017 include Nigeria (\$22 billion), Senegal (\$2.2 billion), Ghana (\$2.2 billion) and Kenya (\$2.0 billion) (World Bank, 2018).

## 2.2 Empirical Literature

The major reasons behind movement of people across border can be classified into two factors: the push and pull factors. The push factors are associated with the area of origin while the pull factors relate to the place of destination. Both can be placed under economic, political, cultural, or environmental reasons. World Bank (2019) and Buettner & Rainer (2020) enumerate these factors to include income gap, employment opportunities, inequality, injustices demographic imbalances etc. Other pull and push factors include social exclusion, discrimination; political victims, corruption, lack of education, health care, and social security; and marriage opportunities. Several studies have explored the importance of remittances on economic growth, however, most of these studies have mixed evidence on the benefit and long-term implications on the origin countries. Matuzeviciute and Butkas (2016) used unbalanced panel data for 116 countries over the period 1990 to 2014 to examine the interaction between remittance and the level of economic growth in the long run.

The study employed OLS, fixed effect model and found that, in generally remittance have a positive impact on long run economic growth, but the impact differs based on the country's economic development level and the abundance of remittance in the economy. The finding of this study is in line with the finding of previous studies such as Khathalan (2012), but contradicts the findings of Balde (2009) and Barajas et al (2009) who both find that the same set of variables do not have long-run relationship.

In a similar study, Adarkwa (2015) examines the impact of remittances on economic growth in four selected West African countries: Cameroon, Cape Verde, Nigeria and Senegal. Using OLS for the panel data from 2000 to 2010 the study found that there is positive effect of remittances and economic growth in Senegal and Nigeria, and negative effect in Cape Verde and Cameroon.

In recent analytical evidence by the World Bank (2019), the effects of migration on host communities continue to indicate more positive outlook despite unfavourable public perception of the immigrant in many high-income countries. The report posits that the trend in migration flows is expected to increase. This trend is driven by three factors: namely, income gaps, demographic imbalances and climate change. Between 2013-2017, the average income of high-income OECD countries was \$43,083 compared to \$795 in low-income countries, a ratio of 54: 1. This is staggering considering the rate of catch up and convergence hypothesis. At current growth rate, it will take more than 135 years to close this income gap. Again, the ratio of old to young has increased in high income countries than in low-income countries. According to World Bank estimates, by 2030, for every young person (age: 15-24), there will be three seniors (age :65 plus) in Germany, Italy and Japan. Conversely, for every senior citizen in Kenya, Ethiopia, there will be 6, 5, 7, 9 young persons' respectively. This indicates a stagnating fertility rate and increase life expectancy in high income country, and burgeoning population explosion in low-income countries. On this note, Buettner & Rainer (2020) emphasized that if economies of Sub-Saharan African countries fail to provide enough job opportunities for the rapidly growing young workers in the region there will be uncontrollable increase in the number of migrants from the region.

On climate change influence, Benko (2017) asserts that the number of migrants as a result of climate change has increased and will continue to increase, however, the exact number and impact is difficult to quantify. A recent World Bank report projects that, in the absence of significant improvement in reducing greenhouse gas emissions and encouraging development, there will be massive movement of people within Sub-Saharan African countries. Besides climate, conflict is one the major push factor contributing to the intra-regional movement, and two third of migration in sub-sahar Africa are with the continent World bank (2019) and about a third of this movement in Sub-Saharan African countries can be attributed to conflict in region (African Development Bank, 2020).

Nevertheless, Salahuddin and Gow (2015) examined the relationship between migrant remittance and economic growth using data from 1977 to 2012 for Bangladesh, India, Pakistan and the Philippines. This study conducted across sectional dependence test, CIPS panel unit root test, panel Pedroni and Westernlund co-integration tests and employed the PMG technique. The result shows that there is a highly significant long-run positive relationship between remittance and economic growth in these countries. However, indicates an insignificant positive association between them in the short-run. The error correction term in the short run is -0.037 suggesting that approximate 3% of the deviations in the short-run from the long-run equilibrium have corrected each year.

The overall results support the argument that remittances are playing increasingly important role for these countries' economies. The finding of this study confirmed the finding of salahuddin (2013), though they used different methodology. Similarly, Aboulezz (2015) using ARDL techniques to determine the effect of international remittance on economic growth in Kenya for the annual time series data from 1993 to 2014. The result shows that the international remittance indicators are significant factors influencing the economic growth in Kenya and concluded that economic growth in Kenya has largely driven by international remittances. The finding of this work is in line with findings of previous studies such as Qayyum, Javid and Aarif (2008), Karamelikli and Bayar (2015). The limitation of this study is that of the period.

Karamelikli and Bayar (2015) examined the relationship between remittance, gross domestic saving, foreign direct investment and economic growth of turkey for the period 1974 to 2013 using ARDL method. The study found that, remittance, FDI, and gross domestic saving had positive impact on economic growth. The finding and methodology of this study is consistent with that of Aboulezz (2015). This study failed to find long run relationship among the variables.

In another study, Assaf (2015) analyzed the effect of remittance and other traditional sources of economic growth (gross fixed capital formation, foreign direct investment, labour force) on economic growth in Jordan. For the annual time series data spanning from 1975 to 2013 using OLS and found positive effect of remittances, gross fixed capital formation, on GDP and a negative effect of FDI and labour force on GDP. The result of this study confirmed the result of previous studies such as Salahuddin (2013).

However, Nyeadu and Atiga (2014) investigate the link between remittance and economic growth in Ghana from 1980 to 2012 using Granger-causality and co integration test under the VAR framework. The result showed a unidirectional link between remittance and economic growth and showed that remittance lead to economic growth marginally. But economic growth does not lead remittance. They concluded that remittance played a very useful role in promoting house welfare and health. They also recommended that policies regarding emigration should put in place to make it more encouraging to emigrate and remit to Ghana since remittances promote economic growth.

While, Salahuddin (2013) estimated the effect of remittances on growth for a panel data of some Asian countries namely: Bangladesh, India, Pakistan and Philippines from 1977 to 2009 using OLS. The result shows that there is positive relationship between remittances and growth. The finding of this study is in line with finding of Yaseen (2012) but contradicts the findings of Koyamah-mash (2012), Balde (2009). The major limitation of this study is that it failed to find long-run relationship. In addition, Khathalan (2012) established the long run and short run relationship between workers' remittances and economic growth in Pakistan during the period of 1976 – 2010 using ARDL and the ECM techniques. The result shows that there is positive and significant relationship between worker's remittances and economic growth in long run and short run. The finding and methodology of this study is in line with finding and methodology of Karamelikli and Bayar (2015).confirmed the finding of Qayyum, Javid, Arif (2008) and contradicts with finding of Balde (2009).

Abu Siddique, Selvanathan and Selvanathan (2012) employed Granger – causality test under a VAR framework to investigate the causal link between remittances and economic growth in Bangladesh, India and Sri Lanka for the period 1976 to 2006. The study found that growth in remittances does not lead to economic growth in Bangladesh and in India, and there is no causal relationship between growth in remittances and economic growth; but in Sri Lanka, a two – way directional causality has found. that is, economic growth influences growth in remittances and vice – versa.Koyamah – mash (2012) also found that remittances do not lead to economic growth in ten ECOWAS countries. The finding of this study is consistent with finding of previous studies such as Barajas et al (2009) and contradicts the finding of Iheke (2012).

However, Iheke (2012) analyzed the effect of remittances on Nigerian economy using OLS from 1980 to 2008 and found positive effect, which contradicted the finding of Barajas et al (2009) and Koyama – mash (2012) and in line with finding of Yaseen (2012). The major limitation of this study is that the period is not enough to give better analysis.

Yaseen (2012) observed the impact of remittances on economic growth for the panel data of 7MENA countries over the period of 2000 – 2010 using fixed effect model. The results show that there is positive impact of remittances on economic growth. Moreover, Ahmed, Sugiyarto and Jha (2010) examine the impact of remittances on economy and household welfare based on the data from Household Integrated Economic Survey (HIES) of Pakistan using general equilibrium framework and micro econometric analysis. The finding of this study shows that reduction in remittances will reduce GDP, investment and household consumption, which in turn will increase poverty, and concluded that the probability of household becoming poor decreases by 12.7% if they receive remittances and the poverty head count ratio and Gini Coefficient decline by 7.8% and 4.8% for household receiving remittances.

In contrast, Barajas et al (2009) investigated the growth impact of remittances in 84 recipient countries using panel data for the period of 1970 to 2004 and found negative impact of remittances on economic growth. The result of this study is in line with result of Koyamah-mash (2012). But, Balde, (2009) assessed the impact of migrants' remittances on economic growth for the panel of 28 Sub – Saharan African countries (SSA) for the period of 1980 to 2004 using Two Stage Least Stage (TSLS) instrumental variable. The result of this study shows that the remittances do not have direct positive impact on economic growth in SSA countries, and concluded that, remittances may have indirect positive impact on growth through several channels. On the contrary,Ahortor and Adenutsi (2009) examine the macroeconomic of international remittances inflows on long run economic growth prospects of 31 small –open developing countries over the period of 1996 to 2006 using GMM. The study found that remittances had a positive impact on economic growth, but remittances contribute more to long run economic growth in Latin American Countries(LAC) than to sub-Saharan African(SSA), and in dynamic terms, remittances retard growth, but with overall positive long run growth impact across these developing countries.

Fayissa and Nsiah (2008) using GMM explored the aggregate impact of remittances on economic growth within the conventional neoclassical growth framework using unbalanced panel data from 1980 to 2004 for 37 African countries. They found that remittances boost growth in countries where the financial systems are less developed by providing alternative way to finance investment and helping overcome liquidity constraints, they also found that a 10% increase in remittance lead to 0.3% increase in the GDP per capita income this suggest a small effect of remittances on GDP growth. The finding of this study is consistent with finding of Ahortor and Adenutsi(2009) and inconsistent with the finding of Balde (2009).

Qayyum, Javid and Arif (2008) investigate the importance of remittances inflow and its implication for economic growth and poverty in Pakistan over the period of 1973 – 2007 by employing ARDL technique. The finding of this study indicates that remittances have positive and significant effect on economic growth. Furthermore, the study also finds that remittances have a strong and statistically significant impact on poverty reduction, thus suggesting that there are substantial potential benefits associated with international migration, for poor people in developing countries like Pakistan. Their findingscorroborate with the study of Aboulez (2015), Karamelikli and Bayar (2015), Khathalan (2012).

**2.3 Theoretical Review**

**Theoretical Framework**

Based on the theories reviewed above, this study adopts the endogenous growth model as a theoretical framework to analyze the impact of remittances on economic growth in SSA. The study appeals this model because it is the best-known model that adequately addresses the shortcomings of the famous neoclassical growth model proposed by Solow (195).

This can be determined within the context of the simple AK endogenous growth model. Following Cobb and Douglas (1928), the mathematical expression of the AK production function takes the form:

$$Y=A K \dots\dots\dots(2.1)$$

Where Y is the per worker output, A is a stock of technology which is the same as Total Factor Productivity (TFP) and K is the capital stock.

Based on the above equation the impact of remittances alongside other sources of growth can be capture through the TFP (A) because according to Rao and Hassan (2011, 2012) remittances, openness, FDI increase TFP they are among the TFP improving variables. As Durlaufetal (2005) found that the TFP variables in various empirical work is as many as 145. Therefore the impact of remittances on economic growth is determined through changes in (A) and it assumed that (A) is a function of remittances, FDI, openness which are the set of control variables in this work and K represent capital stock proxy by domestic investment to GDP ratio represent the constant elasticity of output relative to K.

**3. Methodology**

**3.2 Source and type of data**

The study will use panel secondary data on economic growth, remittances, FDI, openness, domestic investment for Nigeria, Ghana, Kenya and Senegal over the period of 1980-2017. The data are obtained source from World Bank, World Development Indicators.

**3.3 Model Specification**

This study analyzes the long run relationship between remittances and economic growth using panel cointegration. We adopted and modified the endogenous model following the work of Salahuddin and Gow (2015). The study uses growth domestic product at current USD (GDP) as dependent variable and remittances (REM) is measured by personal remittance received, foreign direct investment (FDI) measured by FDI at current USD, trade openness (OPN) is measures by the ratio of export and imports as a percent of GDP and domestic investment (DIV) measured as gross fixed capital formation. The general model is specified as:

$$GDP= F (REM, FDI, OPN, DIV) \dots\dots\dots (3.1)$$

The econometric form of the above equation can be written as:

$$GDP= \beta_0 + \beta_1REM_{it} + \beta_2FDI_{it}+ \beta_3OPN_{it}+ \beta_4DIV_{it}+ \epsilon_{it} \dots\dots\dots(3.2)$$

To make the model linear, the value of the variable would be is transformed to logarithm form except other variables in ratio. Thus, equation 3.2 becomes:

$$\log GDP_{it} = \beta_0 + \beta_1\log REM_{it} + \beta_2\log FDI_{it}+ \beta_3OPN_{it} + \beta_4\log DIV_{it}+ \epsilon_{it} \dots\dots\dots (3.3)$$

Where;

log GDP = Gross Domestic Product

$\log$ REM = Remittances

$\log$  FDI = Foreign Direct Investment

OPEN = Trade Openness

$\log$ DIV = Domestic Investment

Where,  $\beta_i$  are the unknown parameters to be estimated,  $\varepsilon_{it}$  is the disturbance term, subscript  $i$  is the country's cross-country dimension and subscript  $t$  is the country's time series dimension.

### 3.4 Techniques of Data Analysis

The study uses econometric techniques to examine the impact of remittances on growth. To achieve this objective, we employ descriptive statistics, matrix correlation, panel unit root test and panel cointegration test for comprehensive

## 4. Result and Discussion

### 4.1 Panel Unit Root Tests

Levin, Lin and Chu (2002) and Im, Pesaran and Shin (1997) tests were conducted on the variables, to determine whether they are stationary or non-stationary. The two tests were employed to reinforce one another, to ensure their robustness and to boost confidence in their reliability. The tested null hypotheses for both unit root tests are to determine the presence of a unit root. The decision rule is to reject the null hypothesis when the test-statistical value is less than the probability value or posits higher negative values (William, Hill, and Lim, 2008).

**Table 4.1 Panel Unit Root Test**

Variable	LEVEL			FIRST DIFFERENCE				Order of Integration	
	LLC	Prob.	IPS	Prob.	LLC	Prob.	IPS		Prob.
LOGGDP <sub>it</sub>	-1.7817 0.0035*	0.0374**		2.6934	-	-	-	-	I(0)
LOGREM <sub>it</sub>	0.3900	0.6517	2.3150	0.9897	-9.1145 0.0000*	0.0000*		-8.4691	I(1)
LOGFDI <sub>it</sub>	-0.6587	0.2550	0.1973	0.5782	-7.9841 0.0000*	0.0000*		-10.311	I(1)
LODIV <sub>it</sub>	0.3906 0.9886	0.6520		2.2776	-5.63090.0000*	-5.98860.0000*			I(1)
OPEN <sub>it</sub>	-0.4526	0.3254	-1.3806	0.8370	-4.42930.0000*	-7.2259	0.0000*		I(1)

**Source:** Computed and Compiled by the Researchers using E-Views 10 (2019)

The asterisks \*, \*\* indicate rejection of null hypothesis at 1% and 5% level respectively

Table 4.1 above presents the findings of the panel unit root test. The result indicates that only variable GDP is stationary at level using both methods employed i.e. GDP is integrated at I (0). But REM, FDI, DIV and OPEN showed evidence of non-stationarity at level using both methods and their stationary was induced after first difference i.e. REM, FDI, DIV and OPEN are integrated at I (1) therefore, the null hypothesis of unit root is rejected and conclude that there is evidence of order of integration amongst the variables.

### 4.2. Panel Cointegration Test

This study employed the Pedroni and Kao cointegration test. According to Adusah-Poku (2016), both tests are based on residuals resulting from estimating long-run static regression. Cointegration test is carried out to ascertain the long-run relationship in the model (Theonu, Ihedimma and Omenihu, 2018). The decision rule is to reject the null hypothesis of no co-integration if probability value is less than 5% (0.05) level of significance. Otherwise, do not reject (William, Hill & Lim, 2008).

**Table 4.2 Pedroni Panel Cointegration Test**

	Within-Dimension (Panel)	Between-Dimension (Group)
<b>v-statistics</b>	-0.167486 (0.5665)	-
<b>rho-statistic</b>	-1.879584 (0.0301)**	-0.986070 (0.1620)***
<b>PP-statistic</b>	-8.425400 (0.0000)*	-13.47167 (0.0000)*
<b>ADF-statistic</b>	-7.591063 (0.0000)*	-5.521671 (0.0000)*

**Source:** Computed and Compiled by the Researcher using E-Views 10 (2019)

The asterisks \*, \*\*, \*\*\* indicate rejection of null hypothesis at 1%, 5% and 10% level respectively

Table 4.2 shows that in “within dimension”, the v-statistics probability value is insignificant while the rho-statistics probability value is significant at 5%. The PP-statistics and ADF-statistics probability values are significant at 1%. For “between dimension”, the rho-statistics probability value proved significant at 10%, but the PP-statistics and ADF-statistics are significant at 1%. This result reveals that only two out of its seven statistics (panel v-statistics and group rho-statistic) do not reject the null hypothesis of no cointegration. Therefore, the overall results revealed that there is long-run relationship amongst the variables in the model. To affirm further about the existence of cointegration relationship in the model, Kao test was conducted.

**Table 4.3 Kao panel Cointegration Test**

ADF t-statistic	Probability
-8.048928	0.0000*

**Source:** Computed and Compiled by the Researchers using E-Views 10 (2019)

The asterisks \*, \*\*, \*\*\* indicate rejection of null hypothesis at 1%, 5% and 10% level respectively

Table 4.3 presents the result of Kao residual cointegration test. The result confirmed the existence of cointegration amongst the variables in the model as the ADF t-statistics probability value is significant at 1 percent. We, therefore, reject the null hypothesis and concludes that a long-run relationship exists among the variable.

## 5. Conclusion and Recommendation

From the long-run cointegrating parameter estimates, the results suggest that an increase in remittances, foreign direct investment, trade openness and domestic investment, increases economic growth of SSA countries. We therefore recommend that the SSA countries should improve the domestic financial architecture to ease remittance and reduce the cost of transfers into the region.

For the effect of domestic investment in SSA countries, government should create an enabling environment for both private and public domestic investment to thrive through favorable macroeconomic policies that will boost investment opportunities in their economies.

## References

- Aboulezz, N. (2015) Remittances and Economic Growth Nexus: Empirical Evidence from Kenya. *International Journal of Academic Research in Business and Social Science*. Vol. 5, No. (2)12. DOI:10.6007/IJARBS/V5-i12/1958.
- Adarkwa, M. (2015). Impact of Remittances on Economic Growth: Evidence from Selected West African Countries, *African Humane Mobility Review*, Vol. 1, No. 2.
- Adusah-Poka, F. (2016). Which form of foreign capital inflows enhance economic growth? Empirical evidence in Sub-Saharan Africa. *Asian Economic and Financial Review*. 6(10) pp.557-570.
- African Development Bank (2020). African Economic Outlook 2020 Developing Africa's Workforce for the Future. Retrieved from <https://www.afdb.org/en/documents/african-economic-outlook-2020>.
- Ahmed, V & Sugiyarto, G & Jha, S. (2010). Remittances and Household Welfare: A Case Study of Pakistan. *ADB Economics Working Paper Series* 194, Asian Development Bank.
- Al-Khathalan, K. (2012). The Link between Remittances and economic Growth in Pakistan: A Boon to Economic Stability. *British Journal of Economics, Management and Trade*. 2 (3): 167 – 185.
- Assaf, A.A (2015) Workers remittances and economic Growth: Evidence from Jordan. *European Scientific Journal*, Vol.2 No.25.
- Balde, Y. (2009). Migrants Remittances and Economic Growth in Sub-Saharan Africa. Laboratoire d'Analyse et de Prospective Economique (LAPE) Université de Limoges, France Working Paper 200905.
- Barajas, A; Gapen, M.T., Chami. R., Montial, P., and Fullenkamp, C. (2009), DO workers remittance promote economic growth? IMF Staff paper, 52(1), 55-82.
- Benko, J. (2017). How a Warming Planet Drives Human Migration. *New York Times Magazine*
- Buettner, T., & Rainer, M. (2020). Migration Projections: The Economic Case. *KNOMAD Paper No. 37*, World Bank, Washington, DC. Retrieved from [https://www.knomad.org/sites/default/files/2020-02/KNOMAD\\_Paper\\_MigrationProjectionsTheEconomicCase%20\\_TBuettnner\\_RMunez.pdf](https://www.knomad.org/sites/default/files/2020-02/KNOMAD_Paper_MigrationProjectionsTheEconomicCase%20_TBuettnner_RMunez.pdf)
- Dimitriou A. and Stephen G. (2007) “A Modern Approach using Eviews and Microfit” *Applied Econometrics* Revised Edition N-York city.
- Dumitrescu E. and Hurlin C. (2012). Testing for Granger non-causality in heterogeneous panels. *Economic Modeling*, 29(4), 1450-1460.
- Fayissa, B. and Nsiah, C. (2008). The Impact of Remittances on Economic Growth and Development in Africa. Department of Economics and Finance, middle Tennessee State University Working Paper 200802.



- Helwig, N. E. (2017). Data Covariance, Correlation Matrix. University of Minnesota (Twin Cities).
- Iheke, O. (2012). The effect of remittances on the Nigerian Economy, *international Journal of Development and Sustainability* 1 (2): 614 – 621.
- IheohuIhedima and Omerihu (2018) A pool mean group estimation of capital inflows and growth in Sub-Saharan Africa. *The Romanian Economic Journal*, 20(65).
- Im, K.S. Pesaran, M.H., and Shin, Y. (1997) Testing for Unit Roots in Heterogeneous panels, Departments of Applied Economics, University of Cambridge.
- IMF (1991) Balance of Payments Manual 5<sup>th</sup> Edition, Washington DC: International Monetary Fund.
- Jhingan, M.C. (1997) the Economics of Development and Planning.39<sup>th</sup> Revised and Enlarged Edition.Vrinda publication (P) ltd.
- Kaasschieter, J. (2014). Remittances, Economic Growth and the Role of Institutions and Government Policies (Master Thesis).Erasmus School of Economics.ErasmusUniversity. Rotterdam.
- Kapur, D. (2004). Remittances: The New Development Mantra? G-24 Discussion Paper 29 New York and Geneva: United Nations
- Karamelikli, H. and Bayar, Y. (2015) The Relationship between Economic Growth and Remittances in the Presence of Cross-Sectional Dependence. *The Journal of Developing Areas* Vol. 49, No.1.
- Koyameh-Marsh, R.O. (2012). The Impact of Workers remittances on Economic Growth: Evidence form ECOWAS countries. *Journal of third world studies*, Vol. XXIV, No.2.
- Lubambu (2014) The Impact of Remittances on Developing countries. Policy Department Directorate-General for Policies. Policy Department European parliament’s Committee on Development.
- Matuzeviciute, K. and Butkas, M. (2016).“Remittances Development level, and Long-run Economic growth” *Economies* Vol. 4 (28).
- Nyeadi, J.D. and Atiga, O. (2014).“Remittances and economic growth: Empirical Evidence from Ghana,” *European Journal, of Business and Management*Vol, 6 No. 25.
- Pesaran, M.H., Shin, Y., and Smith, R.P. (1999) Pooled Mean Group Estimation of Dynamic Heterogeneous Panels. *Journal of American Statistical Association*.Vol. 94, PP.621-634.
- Qayyum, A; Javid M. and Arf, U. (2008).Impact of Remittances on Economic Growth and Poverty. MPRA paper No. 22941.
- Ratha, D. (2003) Workers Remittances: An Important and Stable Source of External Development Finance. In Global Development Finance: Striving for Stability in Development Finance, Washington, DC: World Bank. 157 – 175.
- Salahuddin, M. (2013). Empirical Link between Growth and remittances: Evidence from Panel Data, *Journal of Applied Business and Economics* Vol. 14 (15).
- Salahuddin, M. and Gow, J. (2015).The Relationship between Economic Growth and Remittances in the Presence of Cross-Sectional Dependence.*The Journal of Developing Areas* Volume 49, No. 1
- Siddique, A., Selvanathan, E.A. &Selvanathan, S. (2012). Remittances and Economic growth: Empirical Evidence from Bangladesh, India and Sri-Lanka. *Journal of Development studies*: 48 (8): 1045 – 1062 DOI: 10.1080/00220388.2012.663904
- Stark, O., &Levhari, D. (1985) On migration and risk in LDCs, *Economic Development and Cultural change*, vol. 31, No 1, pp. 191-196.
- Todaro, M.P. &Smith, S.S. (2011).Economic Development.11<sup>th</sup> edition Pearson ltd Harlow, England.
- William E.; Hill C.& Lim., C. (2008). Using Eview for Principles of Econometrics.Third Edition.
- World Bank (2006), Global Development Finance, April. Washington, D.C.: World Bank.
- World Bank (2017). Migration and Development Brief. Issue 28 Washington D.C.: World Bank.
- World Bank (2018).Migration and Development Bank Brief.Issue 29 Washington, D.C. World Bank.
- World Bank (2019). Leveraging economic migration for development: A briefing for the World Bank Board, Migration and Remittances Team Social Protection and Jobs,
- Xpress Money (2020). Africa Remittance Outlook for 2020. Retrieved from <https://www.xpressmoney.com/blog/industry/africa-remittance-outlook-for-2019>
- Yaseen, H.S. (2012). The positive and Negative Impact of Remittances on Economic Growth in MENA Countries.*Journal of International Management Studies*, Vol, 7 No.1