# Macroeconomic Determinants of Remittance Inflows into Subsahara Africa

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**Abstract**
*The role of macroeconomic factors in determining remittance inflows has long been discussed in the literature. However, conflicting results, majorly due to the large consideration given to static analysis have kept the debate on. This and the importance of recognizing what determines remittance inflows into Sub-Saharan Africa influenced the emergence of this study. The study employed secondary data obtained from World Bank's World Development Indicators (WDI) for the period between 1996 and 2019. The parameters of the model were estimated using the panel autoregressive distributive lag (PARDL) model. The findings revealed that macroeconomic factors such as trade openness and global financial crisis led to increase in remittance inflows into Sub-Saharan Africa while the level of financial development caused a setback to these inflows. The study concluded that better macroeconomic conditions and financial crisis level attract more inflows of remittances into Sub-Saharan Africa. The study recommended that policymakers in Sub-Sahara African countries should take painstaking effort to liberalize their trade relation with the global community in order to aid good ties with them and consequently influence greater inflows of remittance into the region.*

**KEYWORDS:**Financial development, Macroeconomics, Remittances inflow, Sub–Saharan Africa, Trade openness,

**JEL Classification Codes: E51; F24; N17; F4**

## 1. Introduction

Remittance inflows have shown significant effect in Sub–Saharan Africa better than forms of capital inflows, especially during crisis (Adenutsi, 2014). According to him, during crises, inflows of capital such as foreign direct investment and export earnings drop drastically during crisis, given their inability to absorb economic shock and instability. In the World Bank (2016) report, remittances held 2.25 percent of Gross Domestic Products (GDP) for Sub–Saharan Africa, 1.81 percent for the Middle East and North Africa (MENA), 4.46 percent for the South Asia, and 1.14 percent for Latin American and the Caribbean. Ncube and Brixiova (2013) pointed at migrants stocks and recipient countries income expansion as the significant drivers of growth in remittance inflows. This shows that remittance inflows come in hand for developing countries, Sub–Sahara African countries inclusive, with unfavourable balance of payment issues. As asserted by Kadozi (2019), there is high probability of increase in remittances into Sub–Saharan Africa, given the trend of previous data that was studied. As such, remittances will serve as a protection mechanism for most of the countries in the region, because of its contribution to foreign exchange reserves. Apart from being a shield to external shock, remittance inflows boost investments, aid macroeconomic stability, promote small and medium scale enterprises, as well as bring development to education in the country. Issifu

(2018) opined that remittance inflows increase purchasing power, as well as alleviate poverty, which see the citizens maintaining a consistent consumption pattern, rather than fluctuations in consumption due to low income. Hence, remittances possess multiplier effect, given the growth and consistency in consumption of household. Although remittance inflow is growing in every continent among the developing countries, but Sub–Saharan Africa remains among the jurisdictions with lowest revenue recorded. The economic importance of remittance inflow has been favourable to the economy of many third world countries. It has been advantageous in terms of being resilient to unforeseeable shocks than other inflows, but its economic impact varies among the sub–Sahara countries. This could be dependent on the combination of some micro and macro factors, which can have a favourable or a negative economic impact on the receiving country. According to Atiar Rahman and Wadud (2014), approximately 60% of inflow remittances to Sub–Saharan Africa traverse through unofficial/informal conduits, which could result into money laundering, fraudulent activities, and illegitimate market for foreign exchange. Many individuals are taking advantage in the loopholes that are in macroeconomic policies to start exchanging foreign currency. Hence the diversion of the remittances away from the economy, which could lead to financing terrorism. Underground unlawful activities like this disrupt proper management of macroeconomic variables, especially exchange rate and money supply. Therefore, it affects the financial sector adversely, such that it renders policies ineffective in the sector. Furthermore, the macroeconomic conditions in countries of Sub–Saharan Africa are not comparable to those of other regions (Adenutsi, 2014). The region has one of the lowest per capita GDP in the world which makes it vulnerable to many social predicaments and poor economic wellbeing (Moussir & Tabit, 2016). The level of financial development is still at a premature age that a large number of individuals, particularly, those on the semi–urban and rural areas are still financially–excluded, with poor or no access to basic financial services (Adenutsi, 2014). These poor economic conditions might have much to do with the poor level of remittance inflows into the region. This therefore create room for the emergence of this study to examine the macroeconomic determinants of remittance inflows into Sub–Saharan Africa.

## 2. Review of Relevant Literature

The term remittances imply household income from migrant residing and working in a foreign country for short term or long–term period. Remittances according to Ncube and Brixiova (2013) is unreturned, nonmarket financial transfers between people who live in separate countries, usually linked to migration. According to Fajnzylber and López (2008), several factors influence remittances inflow from the micro level perspectives, including family size, proportion of kids to adults within the family, educational qualification, age, gender, among others. He asserted that their influence on remittances could be positive or negative, depending on structure and composition of the household. Accordingly, remittances inflow is affected by various macroeconomic determinant factors, such as economic policies (monetary and fiscal) in the receiving country, external factor such as exchange rates, efficiency of the financial sector, and informal channel of transfer, which also could be positive or negative based on the country's economic situations.

Remittances have proven to be on the increase as a result of the growth in the number of migrants moving to developed countries for source of livelihood. At the moment, remittances stand as the leading inflow across international borders to Africa (Lubambu, 2014). Given, this

development, remittances are perceived as finance of the last resort for some third world countries and an avenue to diversify for average performing nations. However, (Bisong, Ahairwe, & Njoroge, 2020) argue that the percentage of remittances captured in Africa is relatively low when compared to the total amount being remitted, as informal channel take up to 75 percent of the inflow, which is higher than the global percent.

The macroeconomic theory of remittances serves to providing the theoretical foundation of the link between macroeconomic factors and remittance inflows. This theory emanated from the works of Swamy (1981), Brown (1997) and Vargas-Silva and Huang (2006). The theory can be view from both the altruism and portfolio choice points of view. From the standpoint of macro–level altruism, the theory hypothesizes that high remittances exist when negative shocks related with higher paces of joblessness and under-employment happen in migrant's local nation as the frantic macroeconomic conditions propel dynamic and active labour to travel out in look for lucrative greener opportunities. In this context of unadulterated altruism, higher real GDP growth, lower rate of inflation, restricted accessibility to private sector credit and exchange instability in the domestic countries adversely affect remittance inflows (Swamy, 1981; Brown, 1997; Vargas-Silva and Huang, 2006).

In addition, it is conceivable that the expanse between migrant native country and the more advanced country of residence has an inverse effect on both migration and remittances as the cost of migration might restrict the number of active potential migrants and socio-economic ties with relations at home. In contrast, the portfolio choice viewpoint suggests that remittances and GDP growth are inextricably linked, as higher growth implies enriched economic conditions and a larger potential market both of which are necessary for augmented investment, whereas the relationship between remittance inflows and macroeconomic and political instability is negative since investment opportunities may be limited. It is also asserted that restrictive macroeconomic measures, such as exchange rate ceiling, do not result in increased remittances. On the other hand, a liberalized financial sector and improved financial development attract higher remittances (Russell, 1986; World Bank, 2006).

Owusu-Sekyere (2011) investigated the link between remittance inflows to Sub-Saharan Africa and macroeconomic variables. Thestudy employed annual time series data from 1980 to 2008 for 35 Sub-Sahara African nations, 8 West Africa Economic and Monetary Union countries, 5 Economic Cooperation Organization countries, and 5 East Africa Community countries, and 10 Southern African Development Community countries from 1994 to 2008. In the study, dynamic panel data estimation techniques such as least square dummy variable (LSDV) with corrected standard errors, LSDV with correction, generalized method of moments (GMM), feasible generalized least square, and presumably unrelated regressions were used. The findings revealed that the home country's economic conditions are not the primary factor of remittance inflows to the SSA or SADC nations in the panel. Since returns on investments are assumed to be in home country currency units, policymakers in these countries would need to ensure strong economic fundamentals, such as a stable real exchange rate, it was suggested that policymakers in these countries would need to ensure strong economic fundamentals, such as a stable real exchange rate.

Ezeoha (2013) investigates the interplay between financial development and regional

remittances. It shows evidence of insufficient financial infrastructure restricting the flow of remittances using panel data from 32 countries in the region from 1995 to 2009. It also illustrates that the higher the infrastructural development of a country, the bigger the impact on remittances. The study found that financial development and institutional quality have a greater impact in emerging markets than in developing economies, implying that improving Africa's financial system and institutional structures should be at the forefront of current policy efforts to maximize the benefits of remittance.

Atiar Rahman and Wadud (2014) tried to figure out what factors influence remittance inflows in South Asian countries. The theoretical foundation was an additively separable utility function, and the empirical framework is the Arellano–Bover/Blundell–Bond Systems of Generalized Moments (SGMM) method. The study looked at data from five nations in South Asia from 1976 to 2012.The findings show that remittance inflows in South Asia are motivated by altruism as it affects economic situation in the home country, but by self-interest in the case of the host country's economic situation. Remittance inflows are influenced by emigrant stocks abroad, financial progress, and political rights in a major and favorable way. Rana and Hashmi (2015) looked into the factors that influence Bangladeshi worker remittances. To avoid endogeneity, they advocated using foreign macroeconomic variables as a proxy determinant instead of the standard approach of estimating remittance drivers. The study also employed a panel estimating technique to account for country–specific variation in Bangladeshi remittance inflows. Findings showed that changes in the labour force, consumer price index, export, import, government spending, and the devaluation or appreciation of host nations' (remittance income's) currencies can all have a substantial impact on Bangladesh's inbound remittance revenue.

In his article, Adenutsi (2014) aimed to disaggregate the macroeconomic factors of migrant remittances received in Sub-Saharan Africa (SSA). The underlying motive is that permanent and temporary migrants are likely to behave differently to macroeconomic conditions in migrant-host nations and their native or migrant-home countries due to their distinct characteristics. The Generalized Method of Moments (GMM) technique was used to estimate a dynamic paneldata model involving 36 SSA nations during the period 1980–2009 for the empirical analysis. It was discovered that host-country macroeconomic conditions had a similar impact on employee compensation and worker remittances to SSA, although these two types of remittances are driven by different home-country macroeconomic conditions. To attract higher remittances on a more permanent basis, the implementation of stable macroeconomic and pro-growth policies are inevitable in labour-exporting SSA countries.

Laniran and Adeniyi (2015) looked into the factors that influence remittances to Nigeria. Using time series data sourced from the World Bank and International Monetary Fund from 1980 to 2013, key macroeconomic variables with theoretical potential to influence the level of remittances received were subjected to econometric model testing. A log defined model was used as the methodological approach. The findings revealed a favourable long-run and first-lag short-run link between remittance and income levels, but a negative second-lag relationship. In the long run, the results show an inverse link between remittance and inflation. Surprisingly, the short run shows a positive correlation. The short-run link shows that when the price level in the recipient economy rises, remittances received rise as well. The amount of remittances received was found to be more a result of portfolio motives than other macroeconomic factors.

In Sub-Saharan Africa, Singh, Haacker, Lee, and Goff (2016) explored the determinants and macroeconomic role of remittances. The study compiled the most available and comprehensive data set on remittances in the region; it further included data for 36 nations from 1990 to 2008, as well as newly available data on diaspora size and location. Findings showed that remittances are bigger for countries with a larger diaspora or when the diaspora is based in wealthier countries, and they act counter-cyclically, consistent with a shock absorber role. Despite the fact that remittances have a negative effect on growth regressions, countries with well-functioning domestic institutions appear to be better at unlocking the potential for remittances to contribute to higher growth. It was proposed that a more developed banking sector or a more stable political climate may mitigate the negative effects of remittance flows on growth while enhancing their positive benefits. It would be beneficial to identify these crucial institutional reforms and document success stories in order to promote remittances.

Moussir and Tabit (2016) sought to evaluate the major macroeconomic factors of migrant remittances for a panel of 22 highly dependent developing countries observed from 1990 to 2014. The findings highlighted the importance of the GDP of the source nation, the GDP of the receiving country, inflation, financial development, and institutional quality as important factors of personal remittances. Hence, policymakers in poor nations are advised to focus more on providing stable and pro-growth policies in order to attract more remittances. Also, the study suggested that methods be devised to achieve a greater and more consistent rate of economic growth, improved financial market development, and exchange rate stability.

To show how major macro variables effect diaspora remittances, Ojede, Lam, and Okot (2019) used minimal Lagrange Multiplier (LM) unit root tests for endogenous structural breaks in combination with ARCH and GARCH models. The world price of oil denominated in US dollars was used to proxy fluctuations in the Uganda shilling nominal effective exchange rate because remittances might reverse-cause exchange rate movements and domestic income. Rainfall shocks were employed as proxies for income shocks in a non-oil-producing developing economy dominated by the agriculture sector and its related activities to compensate for endogenous bias between remittances and income. The results showed that accounting for structural change in intercepts (levels) and slopes (trends) of important macroeconomic variables of remittances around their major structural break points boosted their explanatory power significantly.

Using the dynamic panel data approach, Issabayev, Saydaliyev, and Avsar (2019) investigated the nonlinear effect of remittance inflows on financial inclusion in high remittance-receiving developing countries from 2011 to 2017. The study discovered that an additional remittance inflow has a detrimental influence on financial inclusion at low remittance levels. The effect, however, eventually becomes beneficial. In contrast to current literature, which claims that remittances promote financial inclusion, the findings of this study revealed that the impact of remittances on financial inclusion was dependent on people's perceptions of institutions. The findings further revealed that remittances had a U-shaped impact on financial inclusion.

Tsaurai and Maseko (2020) used panel data (1997–2014) and econometric estimating approaches such as fixed effects, random effects, and the pooled OLS to study the causes of remittances in transitional economies. Across all three econometric estimate approaches, the

study discovered that FDI and economic growth had a significant negative impact on remittances. Under the fixed and random effects, financial development and savings had a considerable positive influence on remittances, but the pooled OLS technique had a large negative impact. Inflation, which is consistent with known theoretical underpinnings, was also found to have a large positive influence on remittances under both the fixed and random effects. In conclusion, FDI, economic growth, inflation, financial development, and savings were found to have a substantial impact on remittances

Based on the review of past studies with respect to remittances inflows, it could be deduced that Adenutsi (2014), Moussir and Tabit (2016), Ojede, Lam, and Okot (2019) and Tsaurai and Maseko (2020) conducted a research on macroeconomic determinant of remittance inflows in Sub-Saharan Africa. However, these studies have largely focused the investigation on a static analysis basis while ignoring the dynamic relationship that exists between the identified macroeconomic factors and remittance inflows. Moreover, the static analysis only shows the instantaneous impact of these factors on remittance inflows and ignoring the impact of these factors in previous years. The static analysis also ignores the short and long run impact of these factors but only focus on their long-run estimates. Although some of these studies employed generalized method of moment (GMM) which is also a dynamic panel analysis, the GMM estimates do not show the short and long run impact. This therefore, creates a methodological gap in the literature. In addition, most studies were focused on individual developing economies while ignoring the impact of these factors on a set of countries in an entire region. Since the conclusion reached for an individual country in a region cannot be well generalized for other countries of the region due to different peculiarities, it therefore becomes a gap to be filled in the literature to carry out an analysis on a set of countries in an entire region. This also creates a geographical gap in the literature. Hence, the emergence of this study on macroeconomic determinants of remittance inflows into Sub-Saharan Africa, employing the autoregressive distributive lag model in order to show the short-run and long-run impact of these factors on remittance inflows.

## 3.0Methodology

### 3.1 Model Specification

Taking relevant theoretical lessons from the macroeconomic theory of remittances, the model of this study is specified to capture the impact of macroeconomic variables such as per capita income, financial development, trade openness and global financial crisis on remittance inflows. The model is therefore specified as follows:

$$REMITit = \varphi_0 + \varphi_1 GDPP_{it} + \varphi_2 FD_{it} + \varphi_3 TO_{it} + \varphi_4 GFC_{it} + \varepsilon_{it} \quad \text{----------(1)}$$

where: REMIT is Remittance inflows as percentage of GDP; GDPP is GDP per capita; FD is financial development (measured by credit to private sector); TO is trade openness; GFC is global financial crisis; $\varepsilon$ is the disturbance term; $\varphi_0$ is the constant or intercept term; $\varphi_1$–$\varphi_4$ are the coefficients of the variables included in the model.

The coefficients of financial development and trade openness are expected to be positive while those of GDP per capita and global financial crisis period are expected to be negative. This is because, increase in the former variables is expected to increase the inflows of remittances while increase in the latter variables is expected to reduce remittance inflows. The expectation is denoted by the following inequality expression. $\varphi_{2,3} > 0$; and $\varphi_{1,}\varphi_4 < 0$.

### 3.2 Population and Sample of the Study

The population of this study encompasses all the countries of Sub-Saharan Africa which are 54in numbers. However, due to unavailability of consistent data for some countries such as Somalia and South Sudan, partly because of the prevalence of instability in Somalia and the fact that South Sudan, was just granted independence less than ten years ago, these countries were dropped from the analysis of the study leaving the study with a sample of 47 Sub-Sahara African countries.

### 3.3 Data and Variables Employed

This study relied on panel data from Sub-Sahara African countries, which spanned the years 1996 to 2019. The data are gathered from secondary sources in order to create a balanced panel data series based on data availability. Due to a lack of data, certain nations in Sub-Saharan Africa were not examined. The World Development Indicators (WDI) of the World Bank are the primary data sources (2019). Remittance Inflows are calculated as a proportion of total remittance inflows to GDP, and the data comes from the World Bank's World Development Indicators (WDI).

GDP per capita is calculated by dividing GDP in constant 2011 US dollars by total population, and the data comes from the World Bank's World Development Indicators (WDI). The percentage of domestic credit to the private sector in GDP is used to gauge financial development, and the data comes from the World Bank's World Development Indicators (WDI).The share of total international commerce in GDP, i.e. exports + imports, is used to measure trade openness, and the data comes from the World Bank's World Development Indicators (WDI). The Global Financial Crisis is quantified by an indicator variable that takes on 1 for years after the global financial crisis (i.e. 2007) and zero for years before the global financial crisis (i.e. 2005).

### 3.4 Method of Data Analysis

Both the descriptive and inferential analyses were employed in this study. The summary statistics of the variables were used as the main descriptive tool while the main inferential tool employed was the regression analysis, specifically, the Panel Autoregressive Distributed Lag (ARDL) modelas proposed in Pesaran, Shin and Smith (1999).Pesaran, Shin, and Smith (1999) created the Pooled Mean Group (PMG) model, which is based on a cointegrated ARDL framework that has been adapted for use with panel data sets. In fact, PMG likelihood estimators are used to estimate long-run coefficients, which capture the pooling behaviour of homogeneity restrictions, as well as short-run coefficients, which are calculated by averaging across groups and obtaining means of estimated error-correction coefficients and other short-run parameters (Pesaran, Shin & Smith, 1999).

The general ARDL model can be specified as follows:

$$yit = \sum \beth ij * yi{-}1\ pj{=}1 + \sum \delta ij * xi,\underline{t}{-}1\ qj{=}0 + \mu i + \epsilon it \quad \text{----------(2)}$$

where: t = 1, 2..., T identifies the period

i = 1, 2, ..., N identifies the groups;

$xit$ = vector k × 1 of explanatory variables for group i;

$\mu i$ = fixed effects term;

$ב ij$= scalar of coefficients related to all lagged dependent variables; and

$\delta ij$ = coefficient vectors k × 1.

This econometric methodology is capable of preserving critical information about a model's short and long run features. Furthermore, every short-run disequilibrium is viewed as a process of adjustment toward the long-run equilibrium. The Error Correction Mechanism is used to make these changes (ECM). We may find the ECM equation by re-parametrizing Equation (2) as follows:

$$\Delta yit = \emptyset i yi,-1 + \beta i' xit + \sum ב ij* \Delta yi,t-1\ p-1\ j=1 + \sum \delta ij*' \Delta xi,t-1\ qj=0 + \mu i + \epsilon it \text{--------} (3)$$

Where: $\emptyset i = -(1 - \sum ב ijp-1\ j=1)$ is the error correction term for the $i^{th}$ group;

$\beta i = \sum \delta ijqj=0$ is the long-run parameter for the $i^{th}$ group;

$ב ij* = -\sum ב impm=j+1$ , j = 1, 2, ..., p − 1 and

$\delta ij* = -\sum ב impm=j+1$ , j = 1, 2, ..., q − 1.

**4. Results and Discussions**

The summary statistics results presented in Table 1 shows that remittance inflows to SSA was worth of 5.778 per cent of their GDP during the period under investigation. This result also implies that about 6 per cent of the GDP of Sub-Saharan Africa is contributed to be foreign remittance inflows. The result indicates that the countries are minimally spread around this average, reporting a 26.58 per cent of standard deviation, with the country that has the lowest inflows of remittances in a particular year recording it as 0.0001 per cent of its GDP and the country that has the highest inflows of remittances in a particular year recording it as 513.9 per cent of its GDP.

The results also indicate that the sampled Sub-Sahara African countries, on the average, have income per head worth of 2,132.6 US dollars during the period under investigation. The results show that the countries are widely spread around this average, reporting a standard deviation of 3,028.9, with the country that has the lowest income per capita in a particular year recording it as 187.5 US dollars and the country that has the highest income per capita in a particular year recording it as 20,512.9 per cent of its GDP.

The results further indicate that the sampled Sub-Sahara African countries, on the average, have

credit to private sector worth of 26.16 per cent of their GDP during the period under investigation. The results show that the countries are widely spread around this average, reporting a 123.5 per cent of standard deviation, with the country that has the lowest credit to private sector in a particular year recording it as 0.402 per cent of its GDP and the country that has the highest credit to private sector in a particular year, having a record of 2,564.4 per cent of its GDP.

The sampled Sub-Sahara African countries, on the average, have total international trade worth of 78.87 per cent of GDP during the period under investigation. The results further show that the countries are widely spread around this average, reporting a 52.68 per cent in standard deviation, with the country that has the lowest trade openness in a particular year recording it as 17.85 per cent of its GDP and the country that has the highest trade openness in a particular year with record of 376.2 per cent of its GDP.

**Table 1: Summary Statistics Results**

| Variable | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|
| REMIT | 5.778 | 26.58 | 0.0001 | 513.9 |
| GDPP | 2,132.6 | 3,028.9 | 187.51 | 20,512.9 |
| FD | 26.16 | 123.56 | 0.402 | 2,564.4 |
| TO | 78.87 | 52.68 | 17.85 | 376.2 |

Source: Author's Computations, 2021.

*Note: REMIT is remittance inflows; GDPP is GDP per capita; FD is financial development; TO is trade openness.*

Global financial crisis was omitted from this summary statistics because it is an indicator variable of the period, post of the financial crisis period. As such, a descriptive analysis in form of summary statistics like mean, standard deviation, minimum and maximum would not make much sense for it.

**Inferential Analysis**

Prior to presenting the estimation result, some pre-estimation tests were carried such as the test for cross-sectional dependence and unit root test. Both the Pesaran' (2004) and Friedman's (1937) procedures were employed to check for cross-sectional dependence in the dataset. The statistic value and p-value are presented in Table 2 for both procedures in order to verify if the statistics are significant.

**Table 2: Cross-Sectional Dependence Test Results**

| Procedure | statistic | p-value |
|---|---|---|
| Pesaran (2004) | 0.330 | 0.741 |
| Friedman (1937) | 20.42 | 0.999 |

Source: Author's Computation, 2021.

The model has a statistic value of 0.330 and a p-value of 0.741 under the Pesaran test procedure, and a statistic value of 20.42 and a p-value of 0.999 under the Friedman test technique,

according to the results of the cross-sectional dependence test. Given that the null hypothesis in these tests is that there is no presence of cress-sectional dependence in the panel units, the results show that there is insufficient evidence to reject the null hypothesis in both test procedures, since their p-values are more than 0.1. (i.e. 10 percent significance level). As a result, the model has no cross-sectional dependence.

The unit root test was carried out to examine the stationarity of the variables employed in this study as presented in Table 3. With the time series property in the panel data employed for this study, it is important to test if these variables are stationary to avoid a problem of spurious regression result. The unit root test results show that both the Fisher-type ADF and Fisher-type PP test statistics presented for remittance inflows are statistically significant because their p-values are less than 0.05 level of significance. This signifies that there is absence of unit root in this variable and it is stationary. As for trade openness, the Fisher-type ADF statistic is not significant but the Fisher-type PP statistic is significant. Since one of these statistics is significant, then a conclusion can still be reached that there is absence of unit root in this variable and it is stationary. Therefore, both remittance inflows and trade openness are I(0) variables. As for GDP per capita and financial development, both the Fisher-type ADF and Fisher-type PP statistics are not significant. However, both statistics became significant after first difference. Therefore, GDP per capita and financial development are not stationary at their level series but are stationary after first difference, hence they are I(1) variables. This outcome consequently necessitates the use of estimation method such as the panel ARDL Error correction model, which presents both the short-run and long-run estimates.

**Table 3: Unit Root Test Results**

| | Fisher-ADF | | Fisher-PP | |
|---|---|---|---|---|
| Variable | statistic | p-value | statistic | p-value |
| REMIT | 4.299 | 0.000 | 10.43 | 0.000 |
| GDPP | -0.915 | 0.819 | -2.989 | 0.998 |
| D(GDPP) | 20.20 | 0.000 | 35.54 | 0.000 |
| FD | -1.362 | 0.913 | -1.909 | 0.971 |
| D(FD) | 26.75 | 0.000 | 53.27 | 0.000 |
| TO | 0.338 | 0.367 | 1.719 | 0.042 |

Source: Author's Computation, 2021.

*Note: Fisher-ADF is Fisher-type augmented Dickey-Fuller test; Fisher-PP is Fisher-type Phillip-Perron test; REMIT is remittance inflows; GDPP is GDP per capita; FD is financial development; TO is trade openness. Modified Inverse Chi-squared statistic was reported for all variable.*

From the estimation result Table 4, the Hausman test shows a statistic value of 2.56 and p-value of 0.633 for the choice between the pooled mean group and mean group variants and a value of 0.02 and p-value of 1.000 for the choice between the pooled mean group and dynamic fixed effect variants. As it can be seen, both statistics are not significant. Therefore, the pooled mean group is more appropriate than both the mean group and dynamic fixed effect estimates. The pooled mean group result shows that, in the long run, GDP per capita, trade openness and global financial crisis have positive coefficients (0.00003, 0.010 and 0.191 respectively) while financial development has negative coefficient (-0.0003). However, only the positive

coefficients of trade openness and global financial crisis and the negative coefficient of financial development are statistically significant, judging from each of their p-values being less than 0.05 (i.e. 5% significance level). This suggests that these variables are statistically significant at 5%. On the other hand, GDP per capita is not statistically significant because its p-value is greater than even 0.1, which is the 10% significance level. This signifies that financial development, trade openness and global financial crisis have long run impact on remittance inflows to Sub-Saharan Africa while GDP per capita does not have long run impact on remittance inflows to Sub-Saharan Africa.

The significant positive coefficient of trade openness indicates that a percent point increase in the share of total trade in GDP will lead to a long-run rise in remittance inflows to Sub-Saharan Africa as ratio of GDP by 0.01 per cent points. This resultis consistent with the findings of Ezeoha (2013), Ncube and Brixiova (2013), Atiar Rahman and Wadud (2014) and Tsaurai and Maseko (2020) who found that better economic conditions attract higher remittances. Given that global financial crisis is an indicator variable, its significant positive coefficient indicates that SSA countries witnessed more inflows of remittances in the postglobal financial crisis period than in the period prior to the crisis. This is contrary to expectation as global financial crisis is expected to lower the inflow of remittances. However, this finding seem plausible if the crisis has greatly worsen the livelihood of families back home, which will make migrants to put more effort in sending money to the relatives back home.

The significant negative coefficient of financial development indicates that a percent point increase in the share of domestic credit to private sector in GDP will lead to a long-run decline in remittance inflows to Sub-Saharan Africa at ratio of GDP by 0.0003 per cent points. This finding is contrary to expectation and to the findings of Ezeoha (2013), Ncube and Brixiova (2013), Atiar Rahman and Wadud (2014), who noted that better financial system can aid the inflow of remittances. The plausible explanation to this negative effect is that a developed financial system embodies several procedures to get transfer incomes across to individuals, thereby increasing the time spent to receive the money. This might discourage senders and receivers and make them seek alternative route, probably through informal channels which seem to be faster than the formal channel.

**Table 4: Panel ARDL Error Correction Model (ECM) Short-and Long-Run Estimates**

| ariable | Coefficient | z | p-value | Coefficient | z | p-value | Coefficient | z | p-value |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Long-Run Estimates | | | | | |
| GDPP | 0.001 | 0.75 | 0.455 | -0.004 | -0.82 | 0.410 | -0.001 | -0.45 | 0.654 |
| FD | -0.0003 | -0.24 | 0.025 | 0.343 | 1.21 | 0.227 | 0.001 | 0.07 | 0.948 |
| TO | 0.010 | 6.18 | 0.000 | -0.092 | -1.06 | 0.287 | -0.027 | -0.46 | 0.647 |
| GFC | 0.191 | 3.76 | 0.000 | 0.025 | 0.05 | 0.963 | -1.600 | -0.71 | 0.480 |
| | | | | Short-Run Estimates | | | | | |
| .EMIT(-1) | -0.324 | -9.05 | 0.000 | -0.229 | -0.48 | 0.634 | -0.446 | -22.29 | 0.000 |
| ΔGDPP | 0.011 | 1.08 | 0.279 | 0.011 | 1.01 | 0.313 | -0.000 | -0.11 | 0.916 |
| ΔFD | -0.140 | -1.15 | 0.250 | -0.203 | -1.42 | 0.157 | -0.001 | -0.07 | 0.948 |
| ΔTO | -0.052 | -0.94 | 0.345 | -0.009 | -0.48 | 0.632 | -0.054 | -1.43 | 0.154 |
| ΔGFC | -1.913 | -0.98 | 0.327 | 0.081 | 0.28 | 0.777 | 0.240 | 0.1 | 0.918 |
| Constant | 0.423 | 2.06 | 0.039 | 4.090 | 0.95 | 0.341 | 3.981 | 1.65 | 0.098 |
| ountries | 47 | | | 47 | | | 47 | | |
| Hausman test | | | | 2.56 | | 0.633 | 0.02 | | 1.000 |

Source: Author's Computations, 2021.

*Note: REMIT is remittance inflows; GDPP is GDP per capita; FD is financial development; TO is trade openness; GFC is global financial crisis; Δ represents change in a variable; (-1) represents first period lag.*

As for the results of the short–run estimates, none of the macroeconomic variables have significant impact on the inflows of remittance into Sub–Saharan Africa. This is because each of their p–values is greater than even 0.1 (i.e. 10% significance level). This indicates that these macroeconomic variables do not have short run impact on the inflows of remittances into Sub–Saharan Africa.

**5. Conclusion and Policy Recommendations**

This study concluded that macroeconomic factors like openness to trade and global financial crisis are responsible for the increase in remittance inflows to Sub–Saharan Africa whilefactors like financial development are responsible for the decline in remittance inflows to the region. The income level of the countries of Sub–Saharan Africa does not influence the inflows of remittance to them.

The study therefore, recommends that policymakers in Sub–Sahara African countries should take painstaking effort to liberalize their trade relations with the global community in order to aid good ties with them and consequently influence greater inflows of remittance into the region. The study also recommends that the financial sector be further developed with relevant reforms to reduce the amount of time and cost it takes to get foreign transfers to the intended recipients.

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