



## The Effect of Inward and Outward Remittances on Welfare in Africa

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**Abstract:** We estimated the effect of inward and outward remittances on welfare using data on 17 SSA countries from 2005 to 2019, with welfare proxied as consumption. Previous studies on remittances had tended to be focused more on the effect of inward remittances on macroeconomic variables, while few that considered inward and outward remittances were single-country analysis. The study applied the system-GMM estimation approach to accommodate the dynamic nature of the empirical model. Results showed that inward remittances exerted a positive and significant effect on consumption, while the effect of outward remittances was negative and also significant. However, the coefficient of inward remittances, in absolute terms was found to be larger than the coefficient of outward remittances. The instruments used in the estimation was found to be valid by the Sargan and Hansen tests while the absence of serial correlation was confirmed by the Arrellano-Bond tests. Policy around remittances, given the greater weight of inward remittances on consumption should be such that will make remitting cheaper.

**Keywords:** Remittances; Welfare; GMM

**JEL Classification:** F24; E21; C23

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## 1. Introduction

The welfare of economic agents is often the concern of policy makers and governments across the world, and in no less a region than sub-Saharan Africa (SSA) where welfare is disappointingly low. SSA has a high burden of diseases (World Bank, 2013), is riddled with poverty (Asongu & le Roux, 2018) and suffers from gross underdevelopment (Grell-Brisk, 2019). To drive home the level of welfare in SSA, Addison *et al.* (2017, p. 11) posited that “from 1960 to 1980, life expectancy increased by 8.3 years from 41.5 to 49.8 years, while it only increased by 1.6 years to 51.4 years between 1980 and 1999. Due to renewed progress after 2000, 9 years were added by 2015, by which point life expectancy in SSA had reached a level of above 60 years”. Researchers have investigated some of the determinants of welfare in Africa to include employment, level of education and dependency ratio (Biyase & Zwane, 2017). One of the factors that have influenced welfare in Africa is globalization which has enabled the movement of goods, people and ideas across the world with little friction, enabled migrants from home countries move to host countries, earn an income and remit some to their countries of origin (World Bank, 2018). In recent times, remittances have attracted the attention of scholars and policy makers because of the possible push factors from migrants’ home countries like adverse economic and political conditions, and pull factors in the migrants’ receiving countries like the promise for a better economic outcome (see Mashayekhi *et al.*, (2013)). Attention to remittances has also resulted from the amount being sent to receiving countries by remitting migrants which inched close to foreign direct investment (FDI) and has exceeded official development assistance (ODA) (World Bank, 2019). According to World Bank (2018), in 2017, remittances grew by 8.5% to reach \$466 billion, after a previous, consecutive two year decline.

In SSA, remittances is often viewed as consisting only those that come from Europe, North America and the Gulf-Arab countries. Yet, we find in World Bank (2016) that SSA countries are as much top migrant destinations (especially for other SSA countries) as they are top migrant source countries, thus outward remittances from SSA should be considered in empirical studies.

Most studies on the macroeconomic effect of remittances in SSA are predominantly on the effect of inward remittances, with few studies - for example, Al Akayleh (2016) in Saudi Arabia and Ewubare & Okpoi (2018) in Nigeria - considering the macroeconomic effects of outward remittances. Therefore, the objective of this study is to investigate the dynamic welfare effect of inward and outward remittances in SSA, with welfare proxied as household consumption. The rest of the study is divided as follows: section 2 contains a review of empirical literature, section 3 provides the empirical methodology, while section 4 presents data sources and measurement, section 5 presents results and discussion while section 6 contains the conclusion.

## 2. Empirical Literature

Several studies have been carried out on the role of remittances in the welfare of economies in Africa, with welfare taking different forms – consumption and declining poverty.

Some studies have examined the effect of remittances on consumption. For example, Nwaru *et al.* (2011) estimated the effect of migrant remittances on 120 households in South Eastern Nigeria, made up of 60 each of remittance receiving and non-remittance receiving households. Results from the analysis indicated that welfare in remittance receiving households was higher than in non-remittance receiving ones. Abbas *et al.* (2014) examined the welfare improving capability of workers' remittances on households in Pakistan. Drawing samples from 240 households, divided into remittance receiving and non-remittance receiving households across 10 villages in Tehsil 18 Hazari, District Jhang, Punjab, Pakistan, and employing the OLS and logit estimation methods, the study concluded that remittances receipt had a positive and significant effect on household welfare. Awan *et al.* (2015) examined the cost of migration on households and the welfare benefits to households of migration. The study found a significant impact of migrant remittances on household consumption, savings, health and education spending. Munyegera & Matsumoto (2016) in a study on the impact of remittances on household welfare in Uganda using the OLS, Probit and Tobit models, showed that households with access to mobile money had a higher probability of receiving remittances thus improving their per capita consumption expenditure and welfare. Salman (2016) investigated the welfare enhancing effect of migrant remittances among households in Nigeria. The study, adopting the propensity score matching (PSM), endogenous switching probit (ESP), and treatment-effects models (TEM) found that remittances had a positive impact on economic welfare. Specifically, remittance receiving households had a little over 92 percent more per capita expenditure (proxy for welfare) than non-receiving households. Akanle & Adesina (2017) examined the welfare effects of remittances on households in Nigeria. Households for the study were divided up into remittance receiving households and non-remittance receiving households. A total of 1,115 household members were sampled for the study from 2015 and 2016. Using the OLS estimation method, the study found that there was a significant positive relationship between remittances and welfare. Cuong & Linh (2017) examined the welfare effect of remittances and migration on 4, 157 households in Vietnam. Adopting the fixed effects regression, the study found that international remittances had a positive effect on household income and expenditure. More specifically, remittances received improved the per capita income and expenditure of receiving households and the overall welfare of the households. Ajaero *et al.* (2018) examined the relationship among international migration, remittances and welfare of 2000 households in Nigeria using the World Bank Household Surveys for African migration. Adopting the analysis techniques such as quintile estimation, the ordinary least square and

probit regression, findings from the study showed that welfare of household with migrants abroad who send remittances was more than that of non-remittance receiving households. Kangmennaang *et al.* (2018) studied the effect of migration and remittances on the welfare of 1,000 households in Northern and Central Malawi. Using the propensity score matching (PSM), with the augmented inverse probability weighting (AIPW) as the matching tool, the study found that households where migrant members existed had less chances of being food insecure, recorded increases in household assets and improvement in household welfare. Adelowokan, *et al.* (2019) examined the effect of remittances on private consumption in 29 SSA countries from 2002 to 2017 using the GMM estimation method and found that remittances exerted positive but insignificant effect on consumption; a similar finding was reached by Akpa (2018) in a study on Ghana. Bahadir *et al.* (2018) found a positive effect of remittances on welfare and consumption of receiving countries. Javed *et al.* (2015), studied the impact of remittances inflow on the welfare of 400 households in Toba Tek Singh, district of Punjab, Pakistan. The study adopted the propensity score matching method and found statistically significant impact of remittances on the expenditures of migrant households on food and non-food items, thus enhancing the welfare of remittance receiving households. This result was found to be significantly different for non-remittance receiving households. Also applying the propensity score matching technique, Wadood & Hossain (2017) investigated the microeconomic impact of remittances on the welfare of households in Bangladesh. The study found that remittances had a significant effect on poverty reduction while increasing consumption. This result is however more significant from external than internal remittances. Marta *et al.* (2020) examined the effect on household welfare of rural-urban migration in Indonesia using the difference-in-difference estimation technique on 2,581 households of the Indonesian Family Life Survey (IFLS) of 2007. Results from the study indicate that migration significantly increased household welfare through the impact of remittances investment.

Other studies have focused on the poverty effect of remittances. For instance, Koc & Onan (2004) in the study on the welfare effect of remittances on families in Turkey found that remittances receiving households had better welfare outcomes than non-remittance receiving ones. Households that received remittances spent it to meet daily expenditure. While richer households invested their remittances, poorer ones used it to meet everyday consumption needs. Quartey (2006) studied the impact on household welfare in Ghana of migrant remittances. The study adopted the random effects GLS methodology and found that shocks to household welfare was minimized by migrant remittances, with a positive relationship between migrant remittances and household welfare. Viet (2008) investigated the effects of remittances on poverty and inequality in Vietnam. In a sample of 4,008 households, and using the fixed-effects estimation technique, the study found that remittances decreased poverty for remittance receiving households, but increased inequality.

Assaminew *et al.* (2011) examined the impact of migration and remittances on poverty in Ethiopia from 1971 to 2009 in the VAR model from 1,490 respondents, using the binary outcome model. Findings from the study showed that international remittances had a significant negative effect on poverty in urban households. Javid *et al.* (2012) studied the poverty reduction effect of remittances in Pakistan using the ARDL method and found a negative and significant impact of remittances on poverty in the long-run, but a positive effect in the short run. Perhaps, this reflects the time period it takes the migrants to settle in their host countries and earn enough to meet their needs and remit. The study by Azam *et al.* (2016) on the impact of foreign remittances on poverty alleviation in lower middle, upper middle and high income countries using the fully modified OLS estimation method revealed that remittances had a positive but insignificant effect on poverty in high and middle income countries. Imai *et al.* (2017) investigated the impact of remittances on growth and poverty alleviation in Asia. The study adopted the Generalized Method of Moment (GMM) method of Instrumental Variables (IV) in the study. Findings indicated that remittances significantly reduced poverty and promoted economic growth. Imran *et al.* (2019) studied the impact of foreign remittances on poverty in the Punjab province of Pakistan using logistic and IV regression. The study covered 36,400 households in the region. The study revealed that international remittances had a significant negative effect on the incidence and severity of poverty. Kumar (2019b) found that households that received international remittances had about 28% chance of not being poor. Furthermore, poverty in household receiving remittances was lower than in households that did not. The study was carried out on 216 households in 2018 in Bangladesh using the logistic regression model. Akhter & Islam (2019) studied the effect of migration and migrant remittances on poverty in Bangladesh. The study was conducted on 8,449 households in 2014 using the propensity score matching and logistic regression techniques. The study found that internal and international remittances exerted a positive and statistically significant effect on poverty in Bangladesh. The welfare effect of remittances received through its effect on poverty in Haiti is different based on the study of Cardozo *et al.* (2019). The study found that while remittances received had a negative effect on extreme poverty, it had no effect on moderate poverty. In the study, the moderately poor were considered to spend more than US \$346 but lower than US \$680. The extremely poor spent less than US \$346. In a study on the poverty reduction potential of remittances in 10 Commonwealth of Independent States (CIS) from 2000 to 2015 using the Least Square Dummy Variable estimation technique, Abduvaliev & Bustillo (2019) found that remittances was responsible for about 2% fall in poverty. Kumar (2019a) studied the effects of remittances on poverty and welfare in Bangladesh. The study surveyed 360 households in Cumila district in Bangladesh. Adopting the one-way ANOVA, findings from the study indicated that poverty was less and welfare more in remittance receiving households than non-remittance receiving households. The study by Samaraturunge *et al.* (2020) noted that in Sri Lanka, internal and international

remittances were a major source of money to the households. In their study, they found that international remittances reduced poverty and enhanced welfare, improved human and physical capital and increased consumption. Butkus *et al.* (2020) evaluated the poverty effect of remittances on seven Central and Eastern European (CEE) countries from 2006 to 2015 using the POLS, fixed and random effects and 3SLS estimators. The study found that remittances had a significant negative effect on poverty headcount, poverty depth and poverty risk. In a study on the dynamic effect of remittances on poverty and inequality in Kosovo, Arapi-gjini *et al.* (2020) found that absolute and relative poverty in Kosovo were alleviated by remittances. The study used the propensity score matching and dose-response estimations on a cross-sectional dataset of 8,000 households in 2011.

Other studies have found that when entrepreneurs received remittances, they increased investment, output and wages which enabled wage earners increase their consumption. However, when remittances went to wage earners, it contracted welfare as a result of decline in investment and output. In essence, remittances tended to be expansionary in the hands of entrepreneurs – increasing output and wage, but contractionary in the hands of wage earners – reducing output and investment Bahadir *et al.* (2018); remittances increased inequality (Wouterse, 2010), improved economic growth (Evans & Kelikume, 2018), reducing remittances reduced economic growth, investment, consumption in households, with the attendant increase in poverty and reduction in welfare (Ahmed *et al.*, 2010). Furthermore, Sulemana *et al.* (2018) found that there was a direct relationship between remittances and food security in SSA, while (Sulemana *et al.*, 2019) found that remittances had a significant effect on subjective wellbeing in SSA.

Few studies have considered the welfare effects of both inward and outward remittances. For example in Al Akayleh (2016), outward remittances was found to have a negative effect on consumption and investment in Saudi Arabia; Ewubare & Okpoi (2018) estimated the effect of inward and outward remittances on poverty reduction in Nigeria using the ARDL estimation technique. Findings from the study indicated that in the long-run, inward remittances had a negative effect on poverty while outward remittances had the opposite effect.

From the literature reviewed, it is observed that most of the studies focused on the effect of inward remittances on welfare, with welfare proxied as private consumption, economic growth or poverty; and few on the effects of both inwards and outwards remittances. This study contributes to literature by considering the potential effect on welfare - proxied as consumption - of inward and outward remittances. While inward remittances is more common in literature, we have introduced outward remittances because the sampled countries in SSA migrate as much to countries outside SSA as they migrate to countries within SSA as seen in Table (2).

### 3. Empirical Methodology

In the Two-Gap model of Chenery & Strout (1966), developing countries like those in SSA face a savings gap needed for take-off due to the discrepancy between savings and investment and a foreign currency gap needed for development due to differences in exports revenue and imports spending. This gap is closed when developing countries earn additional income. This additional income improves economic welfare through its effect on consumption and investment expenditure. One of such avenues for additional income is through remittances. Following this theoretical background, this study specifies an empirical model by adapting that of Iheonu & Nwachukwu (2020) where remittances was a significant contributor to household consumption in Burkina Faso and Senegal, but not so in the full sample. The model of Iheonu & Nwachukwu (2020) is presented in the following form:

$$HCE_{it} = \vartheta_1 INF_{it} + \vartheta_2 PCI_{it} + \vartheta_3 IREM_{it} + \vartheta_4 CPS_{it} + \mu_{i,t} \quad (1)$$

However, this current study will differ from that of Iheonu & Nwachukwu (2020) by including outward remittances as potentially affecting household consumption. Other variables affecting consumption to be included in an extension of the model in equation (1) are those identified by Biyase & Zwane (2017) which include employment, level of education and dependency ratio, and exchange rate which Okwu *et al.* (2020) posited had a significant effect on consumption. Thus, the model in equation (1) is augmented and presented in equation (2):

$$\begin{aligned} \ln HCE_{i,t} = & \rho \ln HCE_{i,t-1} + \delta_1 \ln IREM_{i,t} + \delta_2 \ln OREM_{i,t} + \delta_3 \ln INF_{i,t} + \\ & \delta_4 \ln PCI_{i,t} + \delta_5 \ln EXR_{i,t} + \delta_6 \ln CPS_{i,t} + \delta_7 \ln UNE_{i,t} + \delta_8 \ln PSE_{i,t} + \delta_9 \ln DPR_{i,t} + \epsilon_{i,t} \end{aligned} \quad (2)$$

Equation (2) is a dynamic regression equation. In equation (2),  $\ln HCE_{i,t}$  is household consumption expenditure in country  $i$  at time  $t$  which is used to proxy economic welfare expressed in its natural log form and  $\ln HCE_{i,t-1}$  is the lagged value of the dependent variable;  $\ln IREM_{i,t}$  is inward remittances in country  $i$  at time  $t$  expressed in its natural log form;  $\ln OREM_{i,t}$  is outward remittances in country  $i$  at time  $t$  expressed in its natural log form. The control variables are as follows:  $\ln INF_{i,t}$  is inflation in country  $i$  at time  $t$ ;  $\ln PCI_{i,t}$  is per capita income in country  $i$  at time  $t$  expressed in its natural log form;  $\ln EXR_{i,t}$  denotes exchange rate in country  $i$  at time  $t$  expressed in its natural log form;  $\ln CPS_{i,t}$  is credit to the private sector in country  $i$  at time  $t$ ;  $\ln UNE_{i,t}$  represents unemployment in country  $i$  at time  $t$ ;  $\ln PSE_{i,t}$  is primary school enrollment rate which is used to proxy human capital in country  $i$  at time  $t$ ; and  $\ln DPR_{i,t}$  denotes dependency ratio in country  $i$  at time  $t$ .

In equation (2),  $\epsilon_{i,t}$  is the error term and is defined thus:

$$\epsilon_{i,t} = \nu_{i,t} + \mu_{i,t} \quad (3)$$

In equation (3),  $v_{i,t}$  is the country fixed effects while  $\mu_{i,t}$  is the idiosyncratic error term. The dynamic panel model specified in equation (2) suffers from two sources of persistence over time:

- i. The inclusion of a lagged dependent variable as a regressor may result in the problem of autocorrelation.
- ii. The unobserved heterogeneity among the units (Olubusoye, Salisu and Olofin, 2016)

Resolving these two sources of persistence requires the General Method of Moment (GMM) estimator. The GMM uses some sets of instruments to deal with the issue of potential correlation between lagged dependent variable and the error term. The difference GMM developed by Arellano & Bond (1991) can be used to deal with this persistence. However, Arellano & Bover (1995) and Blundell & Bond (1998) proposed the system GMM approach which is more efficient than the difference GMM approach because it uses both the levels and first differences of instruments in estimation.

Following a similar study by Adelowokan, *et al.* (2019), this study will use the system GMM estimator for this study.

#### 4. Data Sources and Measurement

This study examined the effect of inward and outward remittances on welfare in SSA. Given that SSA countries are as much a host of migrants as they are source of migrants, data has been sourced from 17 SSA countries for which data on inward and outward remittances are available. The data scope for the study is from 2005 to 2019, which aims to capture the period when SSA remittances (inward and outward) grew rapidly (see Akpa *et al.*, 2020). The variables names, measurement, *a priori* expectation about  $\delta$  and sources are presented in Table (1)



Table 1. Characteristics of Data

<b>Variable Name</b>	<b>Variable Description</b>	<b>Variable Measurement</b>	<b><i>A priori</i> expectation of <math>\delta</math></b>	<b>Source</b>
Household Consumption Expenditure (HCE)	Market value of goods (including durables) and services purchased by households	In current US\$ million dollar	Nil	World Development Indicators (WDI, 2020)
Inward remittances (IREM)	Personal transfers and compensation of employees received by households in home countries	In current US\$ million dollar	Positive (+)	World Development Indicators (WDI, 2020)
Outward remittances (OREM)	Personal transfers and compensation of employees sent from host countries.	In current US\$ million dollar	Negative (-)	World Development Indicators (WDI, 2020)
Inflation (INF)	Persistent rise in the general prices of goods and services.	Annual percentage change in consumer price index	Negative (-)	World Development Indicators (WDI, 2020)
Per capita income (PCI)	Output per person within a country, measured in monetary terms	GDP/population in constant US dollar	Positive (+)	World Development Indicators (WDI, 2020)
Exchange rate (EXR)	The value of a currency against another. In this case, the US dollar	Monthly averages of annual local currency to the US dollar exchange rate	Positive (+) or negative (-)	World Development Indicators (WDI, 2020)
Credit to private sector (CPS)	The financial resources in forms of loans and	% of GDP	Positive (+)	World Development Indicators (WDI, 2020)

	trade credits extended to firms in the private sector by financial institutions			
Unemployment rate (UNE)	The share of labour force that is out of work, but ready and willing to work when work is available	% of total labour force	Negative (-)	World Development Indicators (WDI, 2020)
Primary school enrollment rate (PSE)	Primary school provides basic reading, writing and numeracy skills.	% of gross enrollment	Positive (+)	World Development Indicators (WDI, 2020)
Dependency ratio (DPR)	People younger than 15 and older than 64 who depend on those in the working age (aged 15 to 64)	% of working-age population	Negative (-)	World Development Indicators (WDI, 2020)

Source: Authors' compilation 2021

**Table 2. Top Migrant Destinations of Selected Countries**

S/N	Country	Top migrant destination country
1	Liberia	Guinea
2	Comoros	France
3	The Gambia	Spain
4	Cabo Verde	Portugal
5	Togo	Ghana
6	Guinea-Bissau	Portugal
7	Senegal	France
8	Mali	Cote d'Ivoire
9	Ghana	Nigeria
10	Nigeria	United States

11	Congo, Democratic Republic	The Republic of Congo
12	Uganda	Rwanda
13	Burkina Faso	Cote d'Ivoire
14	Kenya	United Kingdom
15	Malawi	Zimbabwe
16	Eswatini	South Africa
17	Rwanda	Congo, Democratic Republic

Note: South Sudan is the top migrant destination for Uganda but its next top migrant destination, Rwanda, has more data than South Sudan, thus it is used in place of South Sudan.

Source: Compiled by authors from World Bank (2016)

## 5. Results and Discussion

### 5.1. Pre-estimation

#### 5.1.1. Descriptive Statistics

Table (3) and (4) contain the statistical features of the variables employed in the study. This descriptive statistics contains measures of central tendency, measures of dispersion, minimum values, maximum values, peakedness and normality tests. From Table (3 and 4), the average values of HCE, IREM, OREM, PCI, EXR, INF, CPS, UNE, PSE, DPR are 2.49E+10, 1.69E+09, 137.6770, 1336.130, 335.7514, 7.053439, 18.73065, 7.151086, 104.1723, 85.40300 respectively. All variables are positively skewed except DPR. From the table, PSE is platykurtic since its kurtosis is below three, while the rest of the variables are leptokurtic since their kurtosis is above three. The variables in the study are individually not normally distributed as the probability value of the Jarque-Bera statistics are statistically significant.

**Table 3. Descriptive Statistics of Study Variable**

	HCE	IREM	OREM	PCI	EXR
Mean	2.49E+10	1.69E+09	137.6770	1336.130	335.7514
Median	6.33E+09	2.14E+08	52.24447	789.4973	156.9138
Maximum	3.92E+11	2.10E+10	2607.106	4773.917	2586.890
Minimum	5.25E+08	746883.9	0.000000	315.2639	0.905209
Std. Dev.	6.24E+10	4.60E+09	286.8328	1178.160	397.0278
Skewness	4.139319	3.498474	5.149149	1.585844	3.010395
Kurtosis	20.36223	13.71516	37.52494	4.318897	16.95255
Jarque-Bera	2682.376	1187.346	9410.690	85.54342	1674.196
Probability	0.000000	0.000000	0.000000	0.000000	0.000000

Source: Authors' Computation (2021)

**Table 4. Descriptive Statistics of Study Variables (Continued)**

	INF	CPS	UNE	PSE	DPR
Mean	7.053439	18.73065	7.151086	104.1723	85.40300
Median	5.776217	15.61786	5.819000	103.4257	87.46531
Maximum	44.80416	65.74181	28.24000	148.2303	103.2776
Minimum	-4.294873	1.596296	1.017000	58.32719	50.12106
Std. Dev.	6.902635	13.63315	5.972676	20.83669	11.78542
Skewness	1.717385	1.916831	2.097026	0.364735	-0.859316
Kurtosis	8.015326	6.802944	7.252442	2.340648	3.581887
Jarque-Bera	267.8958	211.4053	258.6316	7.009815	23.86911
Probability	0.000000	0.000000	0.000000	0.030050	0.000007

Source: Authors' computation (2021)

### 5.1.2. Correlation Analysis

In Dormann *et al.* (2012), when correlation between two variables is such that  $|r|$  is  $\leq 0.7$ , then there is no possible multicollinearity problem, otherwise, it exists.

Following this rule, the correlation matrix presented in Table (5) shows that the independent variables do not suffer from multicollinearity problem.

**Table 5. Correlation Matrix**

	lnIRE M	lnORE M	INF	lnPCI	lnEXR	CPS	UNE	PSE	DPR
lnIREM	1								
lnOREM	0.6105	1							
INF	-0.2155	-0.2306	1						
lnPCI	0.3480	-0.0647	-0.1943	1					
lnEXR	0.0575	0.3355	-0.2164	-0.5277	1				
CPS	0.1429	0.0187	-0.3483	0.5647	-0.0720	1			
UNE	-0.1725	-0.2024	-0.1397	0.6656	-0.5440	0.2369	1		
PSE	-0.4287	-0.2801	0.3584	-0.0422	-0.0753	0.0074	0.0142	1	
DPR	-0.1073	0.1309	0.1461	-0.6831	0.4802	-0.6973	-0.2765	-0.2760	1

Source: Authors' computation (2021)

## 5.2. Model Results

The results of the estimated model are presented in Table (6). The instruments used in this analysis was set at a limit of (1 3) for the level equation. The results showed that the one-period lag of household consumption was significant at the one percent level. This shows that consumption in SSA is persistent through time. It is also revealed that inward remittances exerted a positive and statistically significant effect on consumption at the five percent level. The coefficient value indicates that a 1 percent rise in inward remittances would lead to about 0.09 percent rise in consumption. Outward remittances is seen to exert a negative and significant effect on consumption. The coefficient indicates that for a 1 percent increase in outward remittances, consumption falls by about 0.05 percent. This is in consonance with the study by Al Akayleh (2016). The results for inward and outward remittances meet our *a priori* expectations. Judging by the value of their coefficients, it would be observed that the negative effects on consumption of outward remittances is compensated for by the positive effects of inward remittances otherwise the gains from inward remittances would be wiped by the trend in outward remittances from the region.

The control variables have shown varied results. From the estimated results, it is shown that inflation exerted a positive and statistically significant effect on consumption, against the negative relationship that was expected. From the result, a 1 percent rise in inflation would lead to about 0.021 percent rise in consumption. This phenomenon may not be entirely unexpected in SSA where the pressure of inflation often force households to spend more on the same goods, especially those goods that are non-household durables such as food and water. The result also showed that the coefficient of per capita income is negative and statistically not significant, against the *a priori* expectation. This indicates that households in SSA consume less the wealthier they become, even if this pattern is not significant. Furthermore, exchange rate is shown to exert a positive and significant effect on consumption. The coefficient shows that consumption rises as exchange rate depreciates. This finding is similar to the long-run positive effect of positive change in exchange rate on consumption found in Okwu *et al.* (2020). Credit to private sector exerted a positive but not significant effect on consumption; the sign of the coefficient of credit to private consumption meets the *a priori* expectations. From the results, if credit to private sector increases by 1 percent of GDP, consumption increases by about 0.2 percent. Additionally, unemployment rate is seen to exert a positive, but not statistically significant effect on consumption, against the *a priori* expectation of a negative relationship. From the results, if unemployment rises by about 1 percent of labour force, consumption is raised by about 0.8 percent. Rising unemployment in SSA increases the dependency on those working, in a region not known for having benefits for unemployed people. Additionally, primary school enrollment rate coefficient is in agreement with our *a priori* expectations. It exerted

a positive effect on consumption even though the effect is not statistically significant. From the results, an increase in primary school enrollment rate by 1 percent of gross enrollment induces about 0.3 percent rise in consumption. Finally, dependency ratio is shown to have a positive effect on consumption, even though it is insignificant; this did not meet our *a priori* expectations. From the results, a 1 percent rise in dependents as a proportion of working-age population induces an increase in consumption by about 0.5 percent.

The statistically significant F-statistics showed that the model is significant overall.

**Table 6. Two-Step System-GMM Estimation Results**

<b>Dependent Variable: lnHCE</b>			
<b>Variables</b>	<b>Coefficient</b>	<b>z-statistics</b>	<b>p-value</b>
<b>Lagged dependent variable (L1.lnHCE)</b>	0.937 (0.041)	22.67***	0.000
lnIREM	0.094 (0.036)	2.58**	0.010
lnOREM	-0.035 (0.017)	-2.01**	0.045
INF	0.022 (0.006)	3.40***	0.001
lnPCI	-0.022 (0.117)	-0.19	0.851
lnEXR	0.030 (0.013)	2.34**	0.019
CPS	0.002 (0.003)	0.74	0.461
UNE	0.008 (0.008)	0.98	0.329
PSE	0.003 (0.003)	0.88	0.380
DPR	0.005 (0.005)	0.86	0.387
Constant	-1.128 (1.222)	-0.92	0.356

**Note:** The standard errors in this estimation are Windmeijer robust standard errors, and they are presented in brackets while the statistical significance is defined as \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , & \*  $p < 0.1$ .

All variables in column 1 are as defined in Table (1).

F-Stat = 12550.52 Prob-value (F-Stat): 0.000

Source: Authors' computation (2021)

### 5.3. Post-estimation Analyses

#### 5.3.1. Serial Correlation Test

Due to the presence of the lagged dependent variable as a regressor in the model, the GMM model tested for serial correlation/autocorrelation. These tests are Arellano-Bond test of autocorrelation: AR(1) and AR(2). The hypothesis to be tested here is that there is no autocorrelation. In Table (7) we present the serial correlation test result which showed that given the probability values of AR(1) and AR(2) at 0.004 and 0.097, at the 5 percent level of significance, we reject the presence of autocorrelation found in AR(1) using the result of AR(2). Thus, the system GMM model adopted for this study is valid.

**Table 7. Serial Correlation**

	<b>Z-statistics</b>	<b>Probability value</b>
AR(1)	-2.88	0.004
AR(2)	-1.66	0.097

*Source: Authors' computation (2021)*

#### Sargan and Hansen Tests

The Sargan and Hansen tests validate the instruments used in the model, testing for over-identification restrictions. The null of the test is that all instruments are valid. In Table (8), we present the result of the Sargan and Hansen tests which show that the instruments employed in the model are valid given that the p-value of the Sargan and Hansen tests are 0.641 and 0.992 respectively.

**Table 8. Sargan and Hansen TEST**

	<b>Chi2 statistics</b>	<b>Probability value</b>
Sargan test	11.57	0.641
Hansen test	4.44	0.992

*Source: Authors' computation (2021)*

#### 5.4. Robustness Check of System-GMM Model

In Bond (2002), the system GMM result is valid only if the coefficient of the lagged value of the dependent variable in the GMM estimate lies between the pooled OLS estimates and Within-group estimates (Fixed effects estimates). From the results presented in Table (9), it is observed that the lag of the system-GMM estimate lies between the OLS and fixed effects estimates. That is  $0.9947702 > 0.9371555 < 0.6567627$ .

**Table 9. Pooled OLS/Fixed Effects Estimation Results**

<b>Dependent Variable: lnHCE</b>			
<b>Variables</b>	<b>Coefficient</b>	<b>t-statistics</b>	<b>p-value</b>
<b>Lagged dependent variable (L1.lnHCE)</b>	0.995/0.657 (0.015)/(0.061)	65.45***/10.84***	0.000/0.000
lnIREM	0.013/0.050 (0.014)/(0.018)	0.96/2.70***	0.339/0.008
lnOREM	-0.012/0.006 (0.009)/(0.010)	-1.33/0.64	0.187/0.524
INF	-0.002/-0.002 (0.002)/(0.002)	-0.72/-0.74	0.473/0.461
lnPCI	0.002/0.634 (0.046)/(0.216)	0.04/2.94***	0.972/0.004
lnEXR	-0.011/-0.155 (0.012)/(0.052)	-0.93/-2.95***	0.353/0.004
CPS	0.004/-0.003 (0.001)/(0.003)	0.00/-0.74	0.997/0.459
UNE	-0.003/-0.009 (0.004)/(0.009)	-0.67/-1.00	0.502/0.318
PSE	0.0001/0.001 (0.001)/(0.002)	0.94/0.51	0.349/0.614
DPR	0.002/-0.002 (0.002)/(0.006)	1.03/-0.37	0.304/0.711
Constant	-0.244/3.462 (0.346)/(1.395)	-0.71/2.48**	0.480/0.014

Note: The statistical significance is defined as \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , & \*  $p < 0.1$ . All variables in column 1 are as defined in Table (1).

Source: Authors' Computation (2021)

## 6. Conclusion

Remittances into SSA has been growing in recent years, so also is outward remittances from SSA. While literature on the macroeconomic effects of inward remittances into SSA are abundant; especially its effects on household consumption, there is scarce literature on how both inward and outward remittances affect welfare in SSA. The few studies on the phenomenon have reported varying results. For example, while Al Akayleh (2016) reported a negative effect of outward remittances on consumption and investment in Saudi Arabia; Ewubare & Okpoi (2018) reported a long-run positive effect in the long-run in Nigeria. We have adopted the System GMM estimation model in our study because the number of cross-sections were more than the number of years and it is a useful model in analyzing short dynamic panels such as the one used in this study. Findings from the study showed that both inward and outward remittances contributed significantly to consumption (proxy for



welfare) in SSA. While the contribution of inward remittances was positive, the effect of outward remittances was negative. However, the coefficient of inward remittances was seen to be larger than that of outward remittances, meaning that the negative effects of outward remittances is countered, almost twice by inward remittances. The implication of this is that while outward remittances cannot be stopped, measures should be taken to make inward remittances easier and cheaper, so that more can be attracted and the negative effect of outward remittances significantly compensated for.

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