

Do migrants' remittances significantly reduce poverty in the West Africa Monetary Zones (WAMZ) ?

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Abstract

This study examined the impact of remittances on poverty for countries of West African Monetary Zones (WAMZ) for the period 1990-2016. Secondary data obtained from World Development Indicators were used for the analysis. The data were analyzed with Pooled Mean Group (PMG) estimator. The results showed that remittance as a share of the gross domestic product has positive relationship with poverty head count ratio both in the short and long run periods, however it is not statistically significant. Hence, remittance has the tendency to rather worsen poverty in the WAMZ contrary to findings from other studies. In the short run, growth rate of the economy and the degree of trade openness reduce poverty count ratio, but per capita income rather worsen poverty. In the long run, foreign direct investment rather worsens poverty by increasing the number of persons who live on less than \$1.90 per day. The study concluded that the positive relationship between poverty head count ratio and migrant remittances as a share of the gross domestic product suggests that households in WAMZ do not invest remittances in profitable projects. The study among other things recommends that households in WAMZ should be prudent on how they spend remittances received. Also, efforts should be made to encourage policies that stimulate economic growth in the zones.

Keywords: *migrants, remittances, poverty, West Africa Monetary Zones.*

JEL: *H2, H3, O4.*

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I. Introduction

Migrant remittances have become an important source of income among households in host countries. Besides its rising volume, its role in enhancing economic performance and improving living conditions of host countries is the main factor that account for its prominence. Drivers of migrant remittances include increased international migration, technological advancements and financial competitiveness that result in the fall in the cost of transmitting funds from one part of the world to another (Acosta et al; 2006). International migrant remittances have been ranked the second most important source of external funding to developing countries, next only to foreign direct investment (World Bank, 2014; Mallick and Mahallick, 2005; Zouhaier, 2019; Adams and Page, 2005; Acosta et al; 2006). With the decline in official development assistance (ODA) and heightened uncertainties associated with private capital flows, developing countries have been advised to focus on encouraging the flows of other international development finance including migrant remittances (Zouhaier, 2019; Mallick and Mahallick, 2005).

In 2003, migrant remittances stood at \$ 93 billion (Ratha, 2011). In 2005, it totaled \$ 188 billion – twice the annual amount of ODA received by developing countries (Adams, 2006). In 2010, the value rose to \$ 300 billion (Ratha, 2011). Since the year 2000, remittances to developing countries have increased on an annual average of 15 percent (Adams, 2006). It is alleged that improvement in reporting and increasing the share of remittances transmitted formally will see to an increase in migrant remittance flows globally. The World Bank (2015) estimates that informal channels could add up to 50% of the global recorded flows. In 2009, global remittance flow was put at \$ 414 billion, of which \$ 316 billion went to developing countries. In 2016, official recorded remittance to developing countries was \$ 429 billion and this rose to \$ 466 billion in 2017 (Yashino and Otsuku, 2019). Global international remittances which stood at \$ 573 billion in 2016 rose to \$ 613 billion in 2017 (Mallick and Mahallick, 2005). Migrant remittances are very important source of financial resources for developing countries. Remittances may be less important than FDI, but they are larger in value and more stable than FDI and portfolio investments (Zouhaier, 2019; Gupta et al; 2007). It appears that over the past two decades, remittances have outpaced private capital flows and ODA (World Bank, 2006).

There are marked significant disparities in global remittances flow (Adams, 2006; Kelbore, 2005). Since the 1980s, remittances flow to countries in Latin America, the Caribbean and East Asia and Pacific regions have grown more rapidly than the average for developing countries as a whole (Adams, 2006). In

2016, the top three recipients—India, China and Philippines –accounted for more than one third of remittances to developing countries. Among the top ten recipients of remittances, only one (Nigeria) is in SSA, while three of the countries are in South Asia (Bangladesh, India and Pakistan).

Over the years, researchers have been interested in investigating the impact of remittances on various dimensions of development in the recipient countries. The World Bank and International Monetary Fund are the key institutions that arouse this curiosity of interest in investigating the impact of remittances on development outcomes. These two institutions have been in the forefront canvassing that if remittances are efficiently utilized, they can be an effective factor in the development and stimulation of economic growth in host countries (Zouhaier, 2019). Studies have reported that countries that can effectively harness the positive externalities inherent in migrant remittances will drastically cut down poverty. Potential pathways through which remittances may cut down poverty include human capital development, financial sector development and economic growth (Zouhaier, 2019; Anyanwu and Erhijiakpor, 2010).

Several studies have explored the impact of various external sources of funding including remittances on economic growth (Qayyum, Javid and Arif, 2010; Menyner and Shera, 2016; Izabella, 2015), but there is dearth of studies that explore the role of remittances on poverty reduction. In this study, we examined the role of remittances on poverty reduction for the countries of West Africa Monetary Zones (WAMZ). The focus on WAMZ is based on the fact that WAMZ as a monetary union is instrumental in promoting regional integration and development in sub-Saharan Africa and provides an institutional framework that facilitates policy discussion and implementation. The econometric method specific to panel data was used for the analysis that is the Pooled Mean Group (PMG) estimator.

Two questions arose; in the first place, do remittances significantly reduce poverty in WAMZ? Second, do other macroeconomic variables (growth rate of the GDP, trade openness, financial sector development, and unemployment rate) significantly impact on poverty in WAMZ?

In section 2.0 we presented literature review on past studies on the impact of remittances on poverty reduction. In section 3, the method for undertaking the analysis is presented. Section 4 presents the results.

II. Brief profile of remittances in the WAMZ

Table 1: Remittance flows in the WAMZ

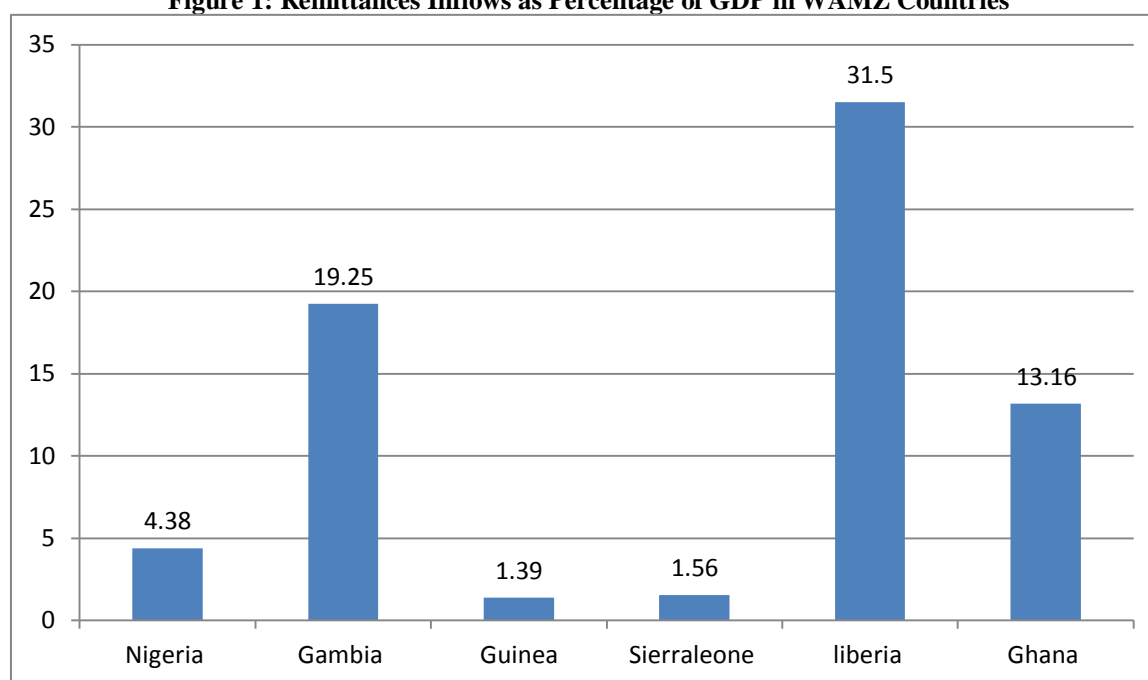
Years	Ghana			Nigeria			Guinea			Liberia			Gambia			Sierra Leone		
	In	out	Net	In	Out	Net	In	out	Net	In	Out	Net	In	out	Net	In	out	Net
2004	82	-	-	2270	21	2249	42	48	-6	58	0.2	58	61	01	60	25	03	22
2005	99	-	-	14640	68	14572	42	60	-18	32	0.2	32	59	01	58	02	02	0
2006	105	-	-	16932	102	16831	30	52	-22	79	0.2	79	64	01	63	16	04	12
2007	117	-	-	18011	54	17957	15	39	-24	62	0.3	62	56	15	41	42	04	38
2008	126	-	-	19206	58	19148	62	56	06	58	0.5	58	65	03	62	23	03	19
2009	114	-	-	18368	47	18321	52	45	07	25	0.1	24	80	08	71	36	03	32
2010	136	-	-	19745	47	19697	46	41	05	31	0.1	30	116	58	58	44	11	34
2011	2135	-	-	20617	76	20541	65	39	26	360	0.1	359	108	37	71	59	21	38
2012	2155	08	2147	20543	39	20504	66	51	16	516	471	45	141	48	93	65	210	44
2013	1864	05	1859	20797	50	20747	93	81	12	383	435	-52	181	Na	-	70	09	61
2014	2008	09	1999	20829	54	20775	121	Na	-	506	310	196	138	Na	-	62	07	55
2015	2100	2607	-507	21060	1057	20003	131	26	105	641	299	342	136	20	116	48	07	41

Source: World Bank's World Development Indicators (2016).

- Not available

Tables 1 shows the trends in remittance inflows and outflows and the net remittances flows in the West African Monetary Zone between 2004 and 2015. The Table reveals that apart from Guinea which recorded negative net remittances in 2004, 2005, 2006 and 2007, other countries in the Zone recorded positive net remittances in all the years under review. Also, Nigeria received the largest amount of remittances in the Zone. This could be attributed to the fact that Nigeria ranks among the top countries with the highest number of citizens living outside the shores of their countries (World Bank, 2014). Following Nigeria in the amount of remittances received among the countries in the Zone within the period is Ghana. This also could be attributed to the population of Ghanaians in the Diasporas engaged in productive activities outside of the shores of the country.

Figure 1: Remittances Inflows as Percentage of GDP in WAMZ Countries



Source: World Bank's World Development Indicators (2016).

Figure 1 shows the trend in remittances inflows as percentage of GDP of countries in the WAMZ in the year 2015. From the Figure, it can be observed that remittances represent a significant proportion of GDP in virtually all the WAMZ countries. In particular, it can be observed from the figure that remittance as a percentage of GDP was highest in Gambia and Liberia. This could be attributed to the small size of their economies in relation to the volume of remittances inflow.

III. Review of Past studies

There is very limited literature on the macroeconomics of poverty. However, recent studies found strong evidence of the significant impact of remittances on poverty reduction. Adams (1991) studied the effects of remittances on poverty in Egypt, and reported that remittances reduce poverty but worsen income inequalities. Cox et al (1996) examined the crucial relationship between remittances and household consumption. The study reported that remittances have the potential to drive down poverty. Barham and Boucher (1998) and Brown and Jemenez (2007) reported that remittances have the potential to improve household wellbeing

Quilibria (1997) indicated that international remittances have a negative effect on welfare if labour capital reduces. Again, Adams (1998) revealed that an increase in remittance is associated with an improvement in income of poor households in Pakistan. Docquier Rapport (2003) in their study concluded that remittances are a necessary condition that can meaningfully reduce poverty. Ratha (2003) explored the effects of international migrant remittances on household welfare among developing countries. They found out that remittances increase income of poor households. Lopez-Cordova (2005) explored the effects of international remittances on development outcomes, using a cross-section of Mexican municipalities in 2000. The study took into cognizance the endogeneity among migration, remittances and development outcome variables. The results revealed that remittances are generally correlated with better schooling, health outcomes and with reductions in some dimensions of poverty. A World Bank study, Adams and Page (2005) examined the impact of internal remittances (from Ghana) and international remittances (from other African countries/ other parts of the world) on investment and poverty in Ghana. In comparison to what households would have spent without remittances, households that received remittances spent less on food, more on education, housing and health. The study concluded that the receipt of remittances can make meaningful cut on poverty. Yang and Martinez (2006) examined the impact of remittances on poverty. The study revealed that remittances can meaningfully reduce poverty. IMF (2007) study found that on the average a 10% increase in the share of remittances in a country's GDP is associated with about 1.5% decline in poverty and 1.1% decline in poverty gap. According to Mansoor and Quillin (2007), international remittances impact more on wealthy households than poorer households. Acosta et al (2007) explored the impact of remittances on poverty, education and health in 11 Latin American countries using nationally representative household surveys, and

attempted to account for one of the inherent costs associated with migration –the potential income that the migrant may have made at home. The results revealed that regardless of the counterfactual used, remittances appear to lower poverty in most recipient countries. Qayyum, Javid and Arif (2008) examined the impact of remittances on economic growth and poverty in Pakistan for the period 1973-2007. The result revealed that migrant remittances contribute to poverty alleviation in the districts of Punjab, Sinah and Baluchistan. The study concluded that there are substantial potential benefits associated with migrant remittances in Pakistan. Gupta, Patillo and Wagh (2009) explored the impacts of remittances on poverty and financial development for 44 countries in SSA. The study proxy poverty by poverty head count ratio, poverty gap, and squared poverty gap, and financial sector development was proxy by the share of private sector credit to the GDP, and the ratio of broad money supply to the GDP. The result showed that migrant remittances reduce poverty and positively impacted on financial sector development. OECD (2009) reported that migrant remittances have positive impact on poverty reduction in middle income countries. Lokshin et al (2010) measured the impact of remittances on poverty in Nepal using two rounds of nationally representative household survey data. We apply an instrumental variable approach to deal with non-random selection of migrants and simulate various scenarios for the different levels of migration comparing observed and counterfactual household expenditure distribution. The result revealed that the 20 percent reduction of poverty in Nepal between 1995 and 2004 can be attributed to higher levels of migrant remittances. Anyanwu and Erhijakpor (2010) examined the effects of migrant remittances on poverty for 33 African countries for the period 1990-2005. The study proxy international remittances by the ratio of private remittances to the GDP, while poverty was proxy by poverty head count, poverty gap and squared poverty gap. Point estimates showed that 10 percent increase in the share of international remittances will result in 2.9% and 2.8% decline respectively in the depth and severity of poverty in Africa. Jimenez-Solo and Brown (2012) examined the impact of remittances on poverty in Tonga. The study utilized data from household survey, and the data was analyzed using Propensity Score Matching to estimate without remittances incomes of migrant households from which counterfactual poverty rates were derived. The result revealed that remittances reduce the incidence of poverty by 31 percent and depth of poverty by 49%. Bertoti and Marchetta (2014) examined the influence of the wave of migration on the incidence of poverty among stayers in Ecuador. The analysis revealed a significant negative effect of migrant remittances on poverty among migrant households.

Imai et al (2014) examined the effects of remittances on the growth rate of the GDP using annual panel data for 24 Asia and Pacific countries. The result revealed that remittances flows have been beneficial to economic growth. Also, volatility of capital flows is harmful to economic growth hence remittances contribute to better economic performance. Masron and Subramanian (2018) investigated the implications of remittances on poverty in 44 developing countries for the period 2006-2014. The result showed that the level of poverty tends to be lower in countries with a higher flow of remittances. The study concluded that the resulting outcome may be due to the increase in household income of the poor by remittances.

IV. Methodology

4.1 Empirical model

This study incorporated remittances into the basic growth poverty relation developed by Ravallion (1997), Adams and Page (2005), and further extended by Masron and Subrimanian (2015). Hence, the basic model is expressed as:

$$Povit = f(\text{gdpgrit}) \dots\dots\dots (1)$$

In equation (1), POV is poverty and gdpgrit is the growth rate of the GDP. Past studies incorporated several other factors, which include trade openness (Basanta and Malvika, 2014; Kelbore, 2015; Onalkoya, Johnson and Ogundayo, 2017; Agusalim, 2017; Zouhaier, 2019), unemployment (Martinez, Ayala and Ruiz-Huerta, 2003; Saunders, 2002; Ebinoluwa and Yusuf, 2018; Ijaiya et al; 2011), and financial sector development (Rewilak, 2017) and per capita income (Anyanwu and Erhijakpor, 2010). Thus, the augmented model is presented as equation (2).

$$Povit = f(\text{gdpgrit; openness it, UNEit; PCYit, fdit}) \dots\dots\dots (2)$$

Our study examined the impact of migrant remittances on poverty; hence the proposed model incorporates the effect of migrant remittances on poverty. Therefore, the proposed model is expressed as equation (3):

$$Povit = f(\text{gdpgrit; openness it, UNE it; PCYit, fdit; Rem it}) \dots\dots\dots (3)$$

Equation (3) is expressed in a functional form as:

$$POVit = \beta_0i + \beta_1\text{gdpgrit} + \beta_2\text{opennessit} + \beta_3\text{UNEit} + \beta_4\text{PCYit} + \beta_5\text{fdit} + \beta_6\text{Remit} + \text{eit} \dots\dots\dots (4)$$

Where $i = 1, \dots, 6$ and $t = 1990, \dots, 2016$ respectively indicate the country and t time periods and the apriori expectation is that $\beta_1, \beta_2, \beta_4, \beta_5, \beta_6 < 0$ while $\beta_3 > 0$. It is expected that growth rate in the gross domestic product has negative association with poverty; given that positive economic growth performance will dent poverty if the fruit of economic growth is fairly distributed. Trade openness exposes a country to economic

diversification and competitiveness and hence improves the living standard of the people. Unemployment has positive association with poverty given that the unemployed do not have means of sustenance, and cannot meet their basic needs. Financial sector development is negatively associated with poverty rate, given that financial sector development will open up new opportunities for people in a country and concomitantly improves their living standard. Remittance has significant negative association with poverty. It can drastically reduce poverty for recipient households, since it can provide the much needed resources to make investment, and in the long run increases household earning power.

4.2 Method of analysis

In the light of the panel nature of our data, we adopted the panel data analysis, which consisted of pooled OLS, fixed effects and random effects model (Gujarati and Porter, 2009). Note in the first place, all the observations are stacked together in the regression with the assumption of no time and cross unit effects. In order to relax this assumption, the fixed effect model is applicable. In the fixed effect model, each entity is different, with the entity's error term and the constant (which captures individual characteristics) not being correlated with those of other entities. However, the fixed effect model is expensive due to the loss of degrees of freedom associated with several cross sectional units (Masron and Subramanian, 2015). The random effect model is the solution, and it assumed that the variations across entities are and uncorrelated with the predictor or independent variables in the model. As noted by Greene (2008), "the crucial distinction between the fixed and random effects is whether the unobserved individual effects embodies elements that are correlated with the regress in the model, not whether these effects are stochastic or not" (p.183). However, traditional panel models such as pooled OLS, fixed effects and random effects models are not appropriate for the following reasons: (i) country specific effects (ii) lagged dependent variable (iii) potential endogeneity of the explanatory variables (Masron and Subramanian, 2015).

In the light of the above problems, we utilized the Pooled Mean Group (PMG) estimator developed by Peseran, Shin and Smith (1999). This method allows for both short-run heterogeneous dynamics and long-run homogeneous relationship for WAMZ, which involves pooling and averaging rather than pooling or averaging alone. This approach is superior to the traditional pooled estimators which include pooled ordinary least square, fixed and random effect models, which allowed the intercept to vary across units, but compelling other error variances and coefficients to be constant. Also, it is superior to the Mean Group (MG) estimator which only produces constant estimate of the average of the parameters, but fails to account for the fact that certain parameters may be constant across the units. Hence, the PMG estimator is considered an intermediate between traditional panel data and MG estimator, by allowing intercepts, short run coefficients and error variances to differ freely across units, but long run coefficients are allowed to remain constant throughout units.

More so and essentially the PMG is a dynamic panel estimator that has the potential of revealing the true nature of the data used in the estimation. Assuming the long-run poverty relationship is given by equation (4) are integrated of order one, I (1), and also cointegrated. Hence, eit is an I (0) process for all I and assumed to be independently distributed of all explanatory variables. Suppose we assumed the maximum fixed lag of every variable to be one (I), thus the ARDL (1, 1, 1, 1, 1, 1) equation is given as equation (5)

$$Pov_{it} = \epsilon_{it} + \theta_{10}igdp_{grit} + \theta_{11}igdp_{grit-1} + \theta_{20}iopenness_{it} + \theta_{21}iopenness_{it-1} + \theta_{30}iUNM_{it} + \theta_{31}iUNM_{it-1} + \theta_{40}iPCY_{it} + \theta_{41}iPCY_{it-1} + \theta_{50}ifdit_{it} + \theta_{51}ifdit_{it-1} + \theta_{60}iREM_{it} + \theta_{61}iREM_{it-1} + \mu_{it}$$

.....(5)

$$\Delta pov_{it} = \epsilon_{it} (\beta_{0i} + \beta_{1i}igdp_{grit} + \beta_{2i}iopenness_{it} + \beta_{3i}iUNM_{it} + \beta_{4i}iPCY_{it} + \beta_{5i}ifdit_{it} + \beta_{6i}iREM_{it} + \epsilon_{it}) - (\theta_{10}igdp_{grit} + \theta_{11}igdp_{grit-1} + \theta_{20}iopenness_{it} + \theta_{21}iopenness_{it-1} + \theta_{30}iUNM_{it} + \theta_{31}iUNM_{it-1} + \theta_{40}iPCY_{it} + \theta_{41}iPCY_{it-1} + \theta_{50}ifdit_{it} + \theta_{51}ifdit_{it-1} + \theta_{60}iREM_{it} + \theta_{61}iREM_{it-1} + \mu_{it})$$

.....(6)

$$\text{Where } \beta_{0i} = \frac{\epsilon_{it}}{1-\pi_i}, \beta_{1i} = \frac{\theta_{10i} + \theta_{11i}}{1-\pi_i}, \beta_{2i} = \frac{\theta_{20i} + \theta_{21i}}{1-\pi_i}, \beta_{3i} = \frac{\theta_{30i} + \theta_{31i}}{1-\pi_i}, \beta_{4i} = \frac{\theta_{40i} + \theta_{41i}}{1-\pi_i}, \beta_{5i} = \frac{\theta_{50i} + \theta_{51i}}{1-\pi_i}, \beta_{6i} = \frac{\theta_{60i} + \theta_{61i}}{1-\pi_i}.$$

Note, the error correction equilibrium in equation (6) allows an ARDL (1, 1, 1, 1, 1, 1)

4.3 Data description

The study used a panel set for the five countries of WAMZ. The study focuses on countries of WAMZ comprising Nigeria, Gambia, Ghana, Sierra Leone, and Liberia. The focus on WAMZ is based on the fact that WAMZ as a monetary union is instrumental in promoting regional integration and development in sub-Saharan Africa and provides an institutional framework that facilitates policy discussion and implementation. The period of the study is from 1990–2016. This was informed by the availability of data. Also, this period recorded high proportion of migrants from WAMZ and huge increased remittances inflows compared to previous decades (UNDP, 2009; UNDESA, 2012; World Bank, 2016).

The key variables that we use to explain the impacts of international remittances on poverty are international remittances and poverty head count ratio (proxy for poverty). We also utilized a number of controlled variables.

International remittance (REM): As a share of the gross domestic product (GDP), they include current transfer by migrant workers and emolument of non-resident workers. They are defined as private current transfer of migrant workers who reside in the host country for more than a year, to beneficiaries in the host countries.

Poverty (POV): it is proxy by poverty head count ratio, which measured the proportion of the population that lives on less than \$ 1.90 (based on 2011 purchasing power parity). This measure is in conformity with the definition proposed by the World Bank (1990), which defined poverty as the inability to reach a minimum consumption threshold measured in terms of basic consumption needs.

Degree of openness (openness): it is measured as the ratio of trade to the GDP. It is the ratio of the sum of export and import to the GDP.

Financial sector development (FD): It is proxy by the share of private credit to theGDP.

The growth rate of the gross domestic product: it is measured by the annual growth rate of GDP per capita.

Unemployment (UNM): It is measured as the percentage of the labour force that is without gainful jobs.

Per Capita Income (PCY):It is the average income of the population.

V. Result

Table 2: Descriptive Statistics of Key Variables (Pooled Data)

	PHC	FD	GDPGR	OPENNESS	PCY	REM	UNEM	PGAP	PGAP2
Mean	6.843827	8.644223	1.203738	70.28808	786.2729	3.632935	5.183833	5.264198	229.0149
Median	0.000000	6.803978	1.632681	64.56317	546.4269	0.912701	4.544500	0.000000	0.000000
Maximum	91.80000	38.34855	91.64805	311.3553	2563.092	31.50344	10.36000	75.90000	5760.810
Minimum	0.000000	0.000000	-50.23014	0.000000	115.7941	0.000000	0.000000	0.000000	0.000000
Std. Dev.	18.62797	6.122999	11.14344	44.19047	568.7657	6.019348	2.380444	14.23213	730.9784
Skewness	2.681809	1.321299	2.281031	2.968007	1.498871	2.474891	0.476448	2.713595	4.247515
Kurtosis	9.035688	6.453668	32.41987	15.74483	4.589060	9.412922	2.909388	9.526522	25.28564
Jarque-Bera	440.0860	127.6503	5982.803	1334.252	77.70307	442.9749	6.184481	486.3367	3839.503
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.045400	0.000000	0.000000
Sum	1108.700	1400.364	195.0055	11386.67	127376.2	588.5354	839.7810	852.8000	37100.42
Sum Sq. Dev.	55867.20	6036.069	19992.39	314400.5	52082599	5833.441	912.3083	32611.11	86027046
Observations	162	162	162	162	162	162	162	162	162

Source: Authors' computation

The descriptive statistics of variables used for the study shows that economic growth rate of the WAMZ within the period under review (1990 to 2016) averaged 1.20%. The highest growth rate recorded in the region within the period under review was 91%, while the lowest was -50%. A private migrant remittance as a percentage of GDP between 1990 and 2016 was 6.84%. This was quite low and it reflects the low level of remittances inflow in WAMZ. The minimum for the period was 0.00 while the maximum was 31.50%. Credit to the private sector as a share of the GDP averaged 8.64% for the period with a maximum of 38.35 % and minimum of 0.00. Openness of the economy averaged 70.29% showing that countries in the WAMZ are well integrated into a global system of trade. The average per capita income for the period was 786.27, which revealed countries in the WAMZ belonged to low income countries. Average unemployment rate for the period was 5.18% with maximum value of 10.36%.

Table 3: Unit Root Tests of Variables

Variables	Homogeneous unit root		Heterogeneous unit root	
	LLC		IPS	
	Level	First difference	Level	First difference
PHC	-4.478(0.000)*	-8.978(0.000)*	-7.225(0.000)*	-11.410(0.000)*
GDPGR	-3.597 (0.002)**	-8.892 (0.000)*	-4.017(0.000)*	-10.358(0.000)*

OPENNESS	1.727(0.957)	-1.315(0.0943)***	0.738(0.769)	-5.828 (0.000)*
FD	0.155 (0.5612)	-2.374 (0.00)*	-0.158 (0.437)	-4.667 (0.000)*
PCY	1.905 (0.9716)*	-3.387(0.004)**	2.311(0.989)	-4.385(-0.000)*
REM	0.824 (0.795)	-7.426(0.000)*	0.572(0.716)	-8.681(0.000)*
UNEM	65.357(1.000)	231.134(1.000)	2.193(0.9858)	-2.951(0.002)**

Source: Author's computation using eviews 9.0, where ***, ** and * indicate significance 1, 5 and 10 per cent levels respectively.

The panel unit root test results indicate that the variables are of mixed order of integration. Considering the LLC unit root test results, PHC, GDPGR and PCY were stationary at levels, while OPENNESS, FD, REM and UNEM were stationary at first difference. However, the IPS results revealed that only PHC and GDPGR were stationary at levels, while OPENNESS, FD, PCY, REM and UNEM were stationary at first difference. Given the mixed stationarity of the results, there is justification for the use of PMG as the method of analysis.

Table 4: Kao Residual-based Cointegration Test

Kao Residual Cointegration Test		
Series: PHC FD GDPGR OPENNESS PCY REM UNEM		
Sample: 1990 2016		
Included observations: 162		
Null Hypothesis: No Cointegration		
Trend assumption: No deterministic trend		
	t-Statistic	Prob.
ADF	-4.554212	0.0000

The Kao residual cointegration test result rejects the null hypothesis of no cointegration at the 1% significance level. This is indicated by the ADF t-Statistic of -4.554212 which passes the test of statistical significance at the 1% level, with a probability of 0.0000, rejecting the null hypothesis of “no cointegration”. Thus it could be reasonably inferred that long -run relationship exists between poverty head count ratio and its hypothesized determinants in this study. According to the Granger-Engle representation theorem, where two or more variables are cointegrated, the short- run relationship between them can be represented with an error correction model

Table 5: PMG results for WAMZ, one lag (1, 1, 1, 1, 1, 1, 1)

Variables	Coefficient	Standard error	T statistics	Probability
Long-run equation				
FD	-0.006988	0.090483	-0.077233	0.9386
GDPGR	-0.250220	0.138373	-1.808304	0.0741
OPENNESS	-0.051355	0.020543	-2.499863	0.0143
PCY	0.012387	0.003850	3.217004	0.0018
REM	0.101866	0.083693	1.217134	0.2269
Short-run equation				
COINTEQ01	-0.050477	0.020190	-2.500079	0.0143
D(FD)	-0.017266	0.007610	-2.268937	0.0258
D(GDPGR)	-0.000696	0.005197	-0.133987	0.8937
D(OPENNESS)	0.004421	0.003182	1.389640	0.1683
D(PCY)	-0.000490	0.001129	-0.434382	0.6651
D(REM)	0.014883	0.009425	1.579080	0.1180
D(UNEM)	-2.648073	2.672466	-0.990872	0.3246
C	-0.026015	0.181075	-0.143668	0.8861

In this section, we identified the short-run and long-run variables that affect poverty in the WAMZ with migrant remittances as the key determinants using PMG. PMG is very helpful in this instance as it involves both pooling and averaging , hence allows for both short run heterogeneous dynamics and long -run homogeneous relationship for countries of WAMZ. The results are presented in table 4. Being an autoregressive distributed lag model due to a lag sensitivity, we imposed a maximum lag length of one for Hannan-Quinn criterion to optimum lag length selected automatically for the various variables.

Migrant remittance as a share of the gross domestic product is positively related to poverty level in both short and long-run periods. This suggests that migrants' remittances have the tendency increase the number of people living below the poverty level in the WAMZ. This contradicts the results by Anyanwu and Erhijiakpor (2010), Zouhaier(2019) and Masron and Subramanian (2018).

The rate of economic growth in recipient country is negatively related to poverty level. This indicates that increasing economic growth for the zones will reduce the number of people who live on less than \$1.90 per day. This findings corroborates study by Anyanwu and Erhijiakpor (2010), Masron and Subramanian (2018) and Adam and Page (2005).

The effect of degree of trade openness in recipient country on remittances inflow in the WAMZ is negative, and statically significant. This implies that higher integration into the global system of tradewill significantly reduce the number of persons living below the poverty level. This finding contradicts the report by Anyanwu and Erhijiakpor (2010), and Zouhaier(2019).

The coefficient of the error correction term is negatively signed, and statistical significant as expected. Hence, it will rightly act to restore equilibrium in the model in the event of short run deviation from it. The absolute value of the coefficient indicates that over 5% of short-run deviation from the equilibrium position is corrected annually to restore equilibrium in the model. Hence the speed of adjustment to equilibrium is quite high.

Robustness check of PMG Model

Despite the significance of all the variables at conventional significance level as shown in table 4 and 5, it is still pertinent to carry out robustness check to ascertain the efficiency of the estimator and the validity of the test statistics. According we conducted the panel cross section dependent and normality test.

Panel cross- section Dependence Test of PMG

This test is crucial especially where the study used panel series. To ignore cross sectional dependence test may have serious consequences, particularly where the residual dependence is not accounted for. The results may lack efficiency and there will be non-validity of statistics tests. In this study we utilized the Breuch and Pagan (1980) and the Pesaran CD and LM tests of 2004. According, all the tests are asymptotically standard normal and the test statistic results result of 7200.335, 144.8179 and 46.88883 respectively strongly reject the null hypothesis of no cross sectional dependence at the conventional statistically significant level. Hence, the results revealed absence of loss of efficiency of the estimator and validity of the test statistics.

Table 6: residual cross section dependence test null hypothesis: no cross section dependence (correlation) in residuals cross-section included:

Total panel (unbalanced) observation:

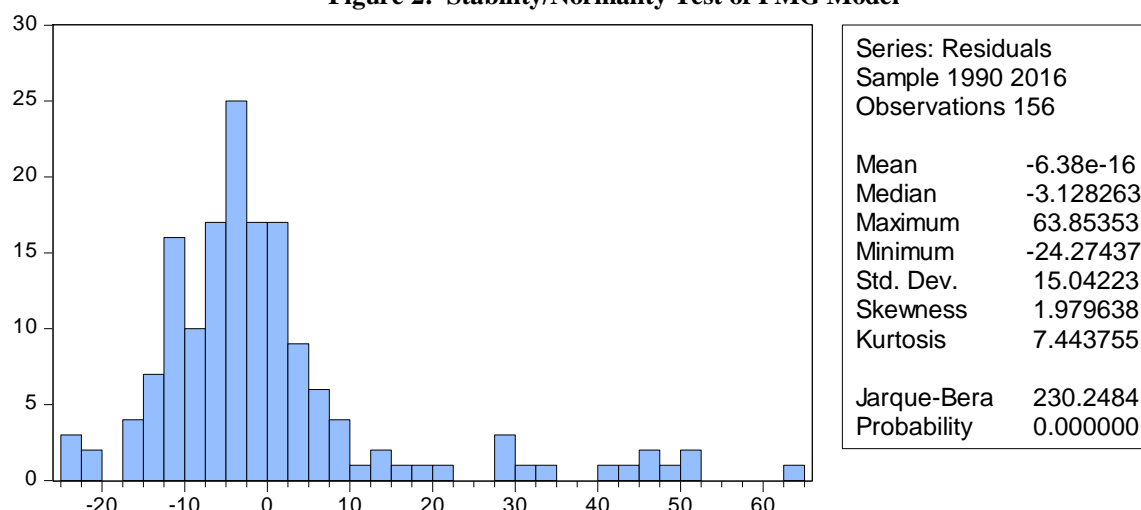
Test	statistics	d.f	probability
Breuch-Pagan LM	7200.335	903	0.0000
Pesaran Scaled LM	144.8179		0.0000
Pesaran CD	46.88883		0.0000

Source: Author computation (2020).

Stability/Normality Test of PMG Model

Tests of stability of the residual are very important in panel studies. This is because it can reveal the true nature of the data. In figure 1, the normality test result is presented. The mean statistic value in the figure below is absolutely zero and positive. The standard deviation value is approximately zero, indicating no dispersion around its mean value. The skewness statistics value of 0.51 is closely to zero, showing absence of skewness and a normality distributed series. The J-B statistics value is very high and significant at the conventional statistical level based on the association p value of 0.000. This suggests that the residual is normally distributed and stable. Given all the statistics, the figure suggests that the PMG model is stable and the histogram clearly indicates normal distribution.

Figure 2: Stability/Normality Test of PMG Model



VI. Conclusion And Recommendations

Migrant remittances as a share of the gross domestic product have positive relationship with the level of poverty in both the short run and long run periods, though not significant. In the long run, economic growth and the degree of trade openness are associated with lower levels of poverty in the WAMZ. In the short run, foreign direct investment is positively associated with poverty level. In the light of the findings, the following recommendations are pertinent:

- i. Households in the WAMZ should be encouraged to invest remittances received in worthwhile investment projects rather than engage in conspicuous consumption life styles.
- ii. Countries in the zones should be encouraged to implement policies that can positively stimulate economic growth.
- iii. Countries in the zone are encouraged to pursue policies that encouraged openness of the economy and encourage higher integration of the economies into the global system of trade and capital flows.
- iv. policies that fairly redistribute income in favour of the poor should be implemented. Policies that encourage the poor include conditional cash transfer, agricultural sector development scheme, rural sector development scheme, educational development, health sector development and implementation of poverty alleviation strategies.

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