
ECONOMIC ANALYSIS OF MIGRATIONS IN WEST AFRICA: X-RAYING THE ECONOMIC PERFORMANCE USING ECONOMETRIC APPROACH

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ABSTRACT

The rate of migrations in West Africa has been on the increase over the years due to the adoption of free movement protocol of Economic Community of West African States (ECOWAS) aimed at promoting trade and development among the member states. As of 2023, the population of migrants within the region of West Africa rose to 7.4 million where nearly 90% of the 7.4 million migrants were among the countries of West African region. This study investigated impact of the variables of migrations on economic performance within the West African region from the year 2000 to 2023, and used a combination of dynamic generalized method of moment (GMM) and fixed-effect regression methods. The study found that net migrations had significant positive impact on economic performance of West African countries; it was also found that migrants' remittances of the receiving countries contributed positively and significantly to economic performance of West African economies; while on the other hand, it was found that migrants' remittances of the sending countries had significant negative impact on economic performance of West Africa; the study further found that refugee population had significant negative impact on economic performance in West Africa. The study therefore recommended the strengthening of the movement protocol enshrined in the migration policy within the West African region, deliberate policies to encourage emigrants to invest at home, putting in place measures that forbid immigrants' outright repatriations of resources, and collaboration of host countries with United Nations High Commissioner for Refugees (UNHCR) in providing special interventions for the refugee population.

Keywords: Migrations, Remittances, Refugee Population, and Economic Growth

Jel Classification: F22, F24, J11, and O47

1. Introduction

Migrations are important determinants of economic growth across the globe (Zsoka, Giovanni, Magali, & Dmitriy, 2021). Despite the growing importance of migrations on international economies, there are concerns on the value or quality of migrants in the host economies and the economic benefits derived from the remittances of the migrants in their indigenous countries. Having good and appropriate measures on migrations can maximize benefits and minimize costs to the development of both countries of origin and of destination. Emigrants in most cases returned higher dividends from their stay abroad while maintaining contacts with the countries of origin, which allowed them to bring their expertise to bear on the development of their countries of origin in different sectors of the economy, and also contribute to the host countries.

In Africa, migrations are largely informal and undocumented, which make it difficult to have accurate data. However, there has been increase in the level of migrations in West Africa over a period of three decades due to the adoption of free movement protocol of Economic Community of West African States (ECOWAS) aimed at promoting trade and development among the member states; International Centre for Migration Policy Development (ICMPD, 2022) reported that 80% of all West African emigrants within the region took advantage of the ECOWAS free movement protocol. As of 2023, the population of migrants within the region of West Africa rose to 7.4 million where nearly 90% of the 7.4 million migrants were among the countries of West African region (Wendy, 2024). The cause of massive migrations in West Africa ranged from limited economic opportunities amidst growing youth population, repressive governments, conflicts, and climate change (African Development Bank, 2023).

The causes of migrations in West Africa are the reason for diverse nature of migrants within the region, which is adjudged to have implications on the economic performance of West African countries. Thus, harnessing the opportunities of migrations depend on the preparedness of both host country and that of the country of origin. It is against the background of mass migrations within the West African region occasioned by the ECOWAS free movement protocol that this study investigated the impact of migrations on economic performance of West African countries.

2. Conceptual and Empirical Review

This section deals with the major concepts of the study which include migrations, economic performance, and the review of empirical studies for more insights.

2.1 Conceptual Review

The major concepts of this study include migrations and economic performance. The concept of migrations as used in this study refers to movement of people from one country to settle in another country. Migration is a movement from one location to another whether that movement encompasses continents, regions, countries or local places where the migration can be temporarily or permanent, voluntary or by force (Idrees, 2021). There are two types of migrations, which include internal migration and international or global migration. Internal migration takes places within the boundaries of states, while international migration or global migration are outside the boundaries of countries and usually consist of continents. Internal migration is the consequences of social economic and geographical conditions within the country while international migration is the product of socio economic, geo political situations and is always governed by international laws of immigration (coming into the country) and emigration (going out of the country).

The concept of economic performance entails how an economy is prospering across all sectors. The gross domestic product (GDP) is often considered as a measure of economic performance, GDP is thus an indicator of economic performance where economic growth is used to describe the increase and expansion in the production of goods and services in an economy. It refers to the general increase in the economic activities and changes in material production, and a process whereby the country's real national and per capita income increases over a long period of time (Goshit & Terese, 2020).

2.2 Empirical Review

Much has been done in the area of migrations and economic growth in different countries and regions of the world, outcome of the studies suggested diverse results. For instance, Idrees (2021) investigated relationships between migrations, foreign remittances and economic growth in Pakistan using multivariate analysis of vector error correction model (VECM); the study found positive relationship between foreign remittances and GDP/per capita and negative impact of workforce migrations on GDP/capita, the study recommended strategies to improve workforce migrations and foreign remittances. Munyinyi (2015) examined emigrations and its effect on Kenya's economic development through the duality of diaspora remittances and brain drain, the regression analysis was adopted and the study found that remittances had positive effect on per capita GDP growth in Kenya, the study recommended enactment of policies that encourage diaspora participation in Kenya's development. Abebe (2010) documented the pattern, trend and

determinants of migration in Africa using rich cross-country migration matrix data and household surveys from Burkina Faso, Ghana, Nigeria and Senegal; the study concluded that socio-economic conditions led to higher rate of emigration by highly skilled individuals and that migration is driven by motives to improve livelihoods, the study recommended strengthening of demographic dynamics and labour market policies to curtail high level of emigrations.

Zsoka, Giovanni, Magali, and Dmitriy (2021) in the quest to ascertain the importance of international migrations studied impact of international migration on inclusive growth, the study alluded that migrations affects migrants themselves by allowing them to achieve higher income as a result of their higher productivity in the destination country, and also affects the migrants' country of destination through the impact of migrations on labour markets, productivity, innovation, demographic structure, fiscal balance, and criminality. Kang and Kim (2012) investigated whether country of origin and destination matter in immigration and economic growth, the study made use of growth model augmented by the embodied human capital of immigrants using dynamic system-GMM estimator, the study found that immigration from developed economies positively affects the economic growth of the host countries. Vincenzo and Leandro (2017) studied the variables of migration, diversity and economic growth using novel data on bilateral migration stocks where the computed indices of fractionalization and polarization found that overall, both indices had a distinct positive impact on real GDP per capita and effect of diversity were more consistent in developing countries. Antonio, Sara, and María (2018) analysed impact of migrants' productivity on economic growth in Spain taking into account methodology of several studies that aimed to estimate the productivity of migrant workers, the study acknowledged positive contributions of migration to the Spanish economy.

Abderraouf (2024) examined repercussions of migration on economic growth in the region of Middle East and North Africa; the study used a combined quantitative analysis, data modelling, and econometric techniques to provide a rigorous assessment of the research objectives where it found that migrations had significant negative effect within the region, the study recommended policies that promote job creation and economic growth. Imouokhome (2023) evaluated impact of migration and remittances on economic growth in Nigeria by employing Auto-regressive Distributed Lag (ARDL), the study found that remittance had positive impact on economic growth, the study recommended review of the spending and allocation of remittances into the country.

3. Methodology

This section presents growth model that explain relationship between the variables of migrations and economic growth.

3.1 Theoretical Model Specification

The explanations of variables' relationships in this study are based on the theoretical motivations of the Cobb-Douglas production function. The study first considered typical economy with a constant elasticity of substitution utility function of the representative agent given by:

$$U = \int_0^{\infty} e^{-\rho t} \frac{c_t^{1-\theta} - 1}{1-\theta} dt \quad (1)$$

Where: U is the utility function; c is per capita consumption of migrants; ρ is inter-temporal substitution; θ is subjective rate of time preference of migrants where a higher rate implies a smaller desirability of future consumption in terms of utility compared to utility obtained by current consumption. Population of migrants, which the study assumed to be identical to labour force denoted as L grows at the constant rate n specified as:

$$L_{it} = L_{i0} e^{nt} \quad (2)$$

From equation 2, Output in each country i at time t is determined by Cobb-Douglas production function specified as:

$$Y_{it} = K_{it}^{\alpha} G_{it}^{\beta} (A_{it} L_{it})^{1-\alpha-\beta} \quad (3)$$

Where $0 < \alpha < 1$, $0 < \beta < 1$ and $0 < \alpha + \beta < 1$. Y is the final good used for private consumption, G is public consumption expenditure, and K is the stock of physical capital where the study consider the case of no depreciation of physical capital. The output used to produce G equals qG which one can think of as being equivalent to a crowding-out effect in private sector's resources. A is the level of technology and grows at the exogenous constant rate m , which is specified as:

$$A_{it} = A_{i0} e^{m_i t + I_{it} \rho} \quad (4)$$

With I_{it} being a vector of institutional quality, political regime, legal origin and other related factors that may affect the level of technology and efficiency in country i at

time t , and ir is a vector of unknown coefficients related to these variables where the state of migrants labour-augmenting technology A depends not only on exogenous technological improvements determined by m , but also on the level of institutional quality. This theoretical underpinning assumed that the presence of efficient and effective institutions ensures that migrants labour can be used for productive purposes, instead of being wasted with red tape or rent seeking activities. Thus, the resource constraint for the economy in terms of per worker is specified as:

$$K_t = Y_t - C_t - qG_t \Leftrightarrow k_t - c_t - qg_t - nk_t \tag{5}$$

Where K_t is the time derivative of physical capital and small letters represent per worker terms after scaling down by L .

Now, writing the conditions that characterize the optimal path for the economy and determine the steady-state solution for private and public consumption and income per migrant assumed worker. The optimal path is the solution specified as:

$$\max_{c_t, g_t} \int_0^{\infty} e^{-\rho t} \frac{c_t^{1-\theta} - 1}{1-\theta} dt \tag{6}$$

$$s.t.: k_t = k_t^\alpha g_t^\beta A_t^{1-\alpha-\beta} - c_t - qg_t - nk_t$$

Equation 6 is the expression of the optimal performance of the model economy.

3.2 Model Specification

Incorporating the optimal level of output per migrant worker in the model economy as specified from equation 1 to 6, the study bridge the theoretical model with an appropriate regression equation that served as a basis for the econometric analysis of this study. Therefore, in line with the theoretical as well as empirical migrations and growth literature, the study had the functional equation specified as:

$$GDPP = f(MIGS, RMTR, RMTS, REPO) \tag{7}$$

Where: $GDPP$ is gross domestic product per capita; $MIGS$ is net migrations; $RMTR$ is migrants' remittances of the receiving country; $RMTS$ is migrants' remittances of the sending countries; $REPO$ is refugee population. The stochastic form of equation 7 is specified as:

$$GDPP = \beta_0 + \beta_1MIGS + \beta_2RMTR + \beta_3RMTS + \beta_4REPO + \varepsilon \tag{8}$$

Where β_0 is the intercept, β_1 - β_4 are the parameters to be estimated, and ε is the error term. Thus, taking the natural log of the variables to maintain common unit of measurement gives:

$$\ln GDPP = \beta_0 + \beta_1 \ln MIGS + \beta_2 \ln RMTR + \beta_3 \ln RMTS + \beta_4 \ln REPO + \varepsilon \quad 9$$

Where *ln* means natural log of the specified variables.

The justification for inclusion of variables *lnGDPP*, *lnMIGS*, *lnRMTR*, *lnRMTS*, and *lnREPO* in the model of the study in line with the theoretical specifications from equations 1 to 6, is on the basis of Cobb-Douglas production function, which explained that the value of final good is a function of physical capital, labour, and technological progress. Thus, the *lnGDPP* suggest value of final goods, and the quality of migrants would determine the quality of available labour to manipulate physical capital and technological progress, hence the inclusion of *lnMIGS*, *lnRMTR*, *lnRMTS*, and *lnREPO* in the model for this study.

3.3 Generalized Method of Moments (GMM) and Fixed Effect Method

Arising from the model of this study as specified in equation 9 to measure impact of migrations variables on gross domestic product per capita, the study adopted GMM that is good at ensuring the sample moments align with their population counterparts, and suitable for panel data (Tsenkwo & Uji, 2023). The starting point of GMM as specified by Hansen (2007) is as follows:

$$Ef(x_t, \alpha_0) = 0 \quad 10$$

Where α_0 in equation 10 is an unknown vector in a parameter space, since parameter is typically not sufficient to write down a likelihood function, other parameters of interest as contained in equation 9 are added. Thus, the stochastic form of the GMM equation 10 is specified by adding the variables of interest as follows:

$$\ln GDPP_t = \beta_0 + \ln GDPP_{t-1} + \beta_1 \ln MIGS_t + \beta_2 \ln RMTR_t + \beta_3 \ln RMTS_t + \beta_4 \ln REPO_t + \vartheta_t + \lambda_t + \eta_{it} \quad 11$$

Where λ indicate the country specific effect, ϑ is the time specific effect, and η is the two-way stochastic error term.

Also, the fixed-effect regression model is considered under the assumption of fixed means among the variables of the group West Africa, thus the starting point of the fixed effect panel regression model is specified as:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 Z_i + \mu_{it} \quad 12$$

Where Y is dependent variable, X is the set of explanatory variables, and Z represents the unobserved time-invariant heterogeneities across the entities. Transforming into the fixed-effect regression model for this study, we have:

$$\ln GDP_{it} = \beta_0 + \beta_1 \ln MIGS_{it} + \beta_2 \ln RMTR_{it} + \beta_3 \ln RMTS_{it} + \beta_4 \ln REPO_{it} + \beta_5 Z_i + u_{it} \quad 13$$

Equations 11 and 13 are the respective GMM and fixed effect regression models that would be used to determine impact of migrations variables on gross domestic product per capita to measure economic performance in West Africa.

Annual time series data on the indexes of GDPP, MIGS, RMTR, RMTS, and REPO were sourced from the World Bank, World Development Indicators – data bank. The scope of the time series data ranged from 2000 to 2022, which gave a sample size of 22 data points for each of the cross-sectional series. The choice of the scope was on the basis of the availability of data and compatibility of the combination of GMM and fixed effect methodology where GMM performed better at samples not more than 25 while fixed effect had no limitation in terms of sample size.

3.4 Estimation Procedure

The study first estimated panel unit root to check stationarity properties in order to avoid misleading results in case of non-stationary variables; estimate panel cointegration to confirm existence of long run relationship between migrations variables and gross domestic product per capital; applied GMM and fixed effect methods to determine impact of migrations variables on gross domestic product per capita; and did a post-test estimation of Hausman specification to check the consistency in the usage of both GMM and fixed effect methods.

4. Results and Discussions

This section dwells on the presentation and analysis of results that covered panel unit root, panel cointegration, GMM and fixed effect as well as post-estimation test of consistency in the findings of the study.

4.1 Panel Unit Root Test

In order to check the stationarity properties of the cross-sectional series used in this study, the panel unit root test results of Levin, Lin and Chu was estimated and presented in Table 1.

Table 1: Result of the Panel Unit Root Test

Test	Variable	At Level		At First Difference		Integration
		Statistics	Probability	Statistics	Probability	
Levin,	<i>LNGDPP</i>	-8.4826	0.6925	-3.7391	0.0021	I(1)
Lin &	<i>LN MIGS</i>	-2.6027	0.0051	-2.4826	0.0013	I(0)
Chu t*	<i>LNRMTR</i>	-5.8315	0.7684	-5.6571	0.0000	I(1)
	<i>LNRMTS</i>	-7.4711	0.8201	-2.5274	0.0000	I(1)
	<i>LNREPO</i>	-3.5783	0.0927	-4.75821	0.0034	I(1)

Source: Authors’ computations using EViews, 2024.

The result of panel unit root test of Levin, Lin and Chut* in Table 1 revealed that all the variables were not stationary at level except variable LNMIGS that was stationary at level; all the variables however, became stationary at first difference, which indicate a case of mixed order of integration since the outcome does not exhibit one or same pattern in the order of integration. The combination of the order of integration as revealed from the outcome of Levin, Lin and Chut* panel unit root test favoured the use of GMM which allow for the application of stationary and non-stationary instrumental variables (Kitamura & Phillips, 1997; Tsenkwo & Uji, 2023). Given the stationarity properties of the cross-sectional series used in this study, the outcomes would not be considered spurious.

4.2 Panel Cointegration Test

In order to confirm existence of long run relationship between the variables of LNGDPP, LNMIGS, LNRMTR, LNRMTS, and LNREPO, the study estimated Kao residual cointegration and presented in Table 2.

Table 2: Kao Residual Cointegration Test

Null Hypothesis: No cointegration

	t-Statistic	Prob.
ADF	-9.578938	0.0000

Source: Authors' computations using Eviews, 2024.

Table 2 revealed that the null hypothesis of no cointegration was rejected since the estimated ADF t - statistics of -9.578938 was statistically significant at 5% level of significant given the probability value of 0.0000. The rejection of the null hypothesis of no cointegration implied existence of long run relationship between the variables of LNGDPP, LNMIGS, LNRMTR, LNRMTS, and NREPO which means that gross domestic product per capita measuring economic performance had long run relationships with variables of migrations, remittances, and refugee population within the West African region.

4.3 Analysis of Dynamic GMM

The results of the specific impact of migrations variables on gross domestic product were estimated using dynamic GMM and presented in Table 3.

Table 3: Dynamic GMM Result Analysis

<u>Dependent Variable = LNGDPP_t</u>		
Number of Instrument = 64		
Number of Observations = 438		
Variable	Estimated Coefficient	Probability Value
<i>LNGDPP_{t-1}</i>	0.4921	0.0000
<i>LNMIGS</i>	0.5726	0.0032
<i>LNRMTR</i>	0.1183	0.0185
<i>LNRMTS</i>	-0.6291	0.0029
<i>LNREPO</i>	-0.5182	0.0041
Diagnostic Tests:		
Arellano-Bond test for AR(1)	z = 2.74	0.0000
Arellano-Bond test for AR(2)	z = 2.45	0.2739
Hansen Test	Chi ² = 23.29	0.4927

Source: Authors' computation using Stata, 2024.

Table 3 showed that the lagged dependent variable $LNGDPP_{t-1}$ was statistically significant with the probability value of 0.0000 that is less than 5% significance level; the statistical significance of the lagged dependent variable confirmed the dynamic nature of the GMM models specified for this study. The preceding explanatory variables indicated that the estimated coefficient of *LNMIGS* was positive (0.5726) and statistically significant (0.0032) at 5% level of significance, which implied that net migrations had significant positive impact on economic performance in West African region. The estimated coefficient of *LNRMTR* was also positive (0.1183) and statistically significant (0.0185) at 5% significance level, which revealed that migrants' remittances of the receiving country had significant positive impact on economic performance in the West African region. On the other hand, both *LNRMTS* and *LNREPO* were negative (-0.6291 and -0.5182 respectively) and all statistically significant at 5% level of significance given their probability values of 0.0029 and 0.0041 respectively, which implied that both migrants' remittances of the sending countries and refugee population had significant negative impact on economic performance within the West African countries.

The diagnostic tests accompanied with the dynamic GMM indicated that AR(1) was statistically significant (0.0000), which further confirmed the normality of the dynamic GMM while AR(2) was not statistically significant at 5% significance level given the probability value of 0.2739 which implied that specification of the normal dynamic GMM was free from issues of autocorrelation. The probability value of 0.4927 for Hansen test with chi-square value of 23.29 that was not statistically significant at 5% significance level revealed that the null hypothesis for

over identification restriction was not rejected, which means that there was no problem of over identification restrictions with the dynamic GMM results.

4.4 The Analysis of Fixed-Effect Results

In order to ensure robustness of outcomes and consistency in the analysis of the dynamic GMM, the study also estimated fixed-effect model and presented in Table 4.

Table 4: Result of Fixed Effect Regression

Dependent Variable = LNGDPP		
Variable	Estimated Coefficient	Probability Value
<i>LNMIGS</i>	0.3815	0.0051
<i>LNRMTR</i>	0.7193	0.0194
<i>LNRMTS</i>	-0.5718	0.0039
<i>LNREPO</i>	-0.4814	0.0272

Source: Authors' computations using Stata, 2024.

The fixed effect results in Table 4 showed a similar outcome as it was in the case of dynamic GMM. The result indicated that both estimated coefficient of LNMIGS and LNRMTR were positive (0.3815 and 0.7193 respectively) with corresponding probability values of 0.0051 and 0.0194 respectively, which implied that both net migrations remittances of the receiving country had significant positive impact on the economic performance of West African countries. Also, the estimated coefficients of both net migrations and migrants remittances of the receiving country had significant positive impact on the economic performance of West African countries. Also, the estimated coefficients of both LNRMTS and LNREPO - 0.5718 and -0.4814 respectively with the respective probability values of 0.0039 and 0.0272 which implied that migrants remittances of the sending country and refugee population had significant negative impact on economic performance in West African countries.

4.5 Post-Estimation Test

In order to check the consistency in the outcomes of the dynamic GMM and fixed effect methods used in the study estimated Hausman specification test and presented in Table 5.

Table 5: Hausman Specification Test Result on Fixed and Dynamic Equations

Test: Ho: difference in coefficients not systematic		
	Value	Prob > chi ²
Chi ²	2.4628	0.0000

Source: Authors' computations using Stata, 2024.

Table 5 showed that the chi-square value of 2.4628 from the Hausman specification test was statistically significant at 5% significance level given the probability value of 0.0000, which indicated that the null hypothesis of difference in coefficients not systematic was rejected, which implied that the specifications and outcomes in both fixed-effect and dynamic GMM equations were systematic and consistent.

5. Discussion of Findings

The finding of this study revealed that net migrations had significant positive impact on the economic performance of West African countries was in line with the findings of Idrees (2021), Vincenzo and Leandro (2017) and at variance with the finding of Abderraouf (2024), which might be attributed to differences in the regions covered. The significant positive impact of net migrations on economic performance in West Africa is largely attributed to the labour quality of the migrants within the region, most migrants move in search of greener pasture with much to contribute and often not idle in their places of abode, they are always engaged in one economic activity of the other, be it skilled or an unskilled which contributed positively to economic growth. The significant positive impact of migrants' remittances of the receiving country on economic performance in West Africa is based on the utilization of the remittances received; such resources are in most cases used in building houses and other investments by the migrants in their countries of origin, which contributed positively to the growth of the region.

The study further found that migrants' remittances of the sending countries had significant negative impact on economic performance of West African countries, which was rationally in line with economic assumption that repatriations constitute leakages which pose adverse effect on the performance of economies. The finding that refugees population had significant negative impact on economic performance of West African countries is attributed to the non-productive nature of the refugees population where in most cases are in distress conditions as a result of the crisis or natural disasters that made them to flee their countries of origin, hence they are often liabilities to the host countries and contributed negatively to economic growth.

6. Conclusion and Recommendations

6.1 Conclusion

The conclusion of this study is based on the findings. The study therefore concluded that migrations had significant positive impact on the economic performance of West African region due to labour quality of the migrants where most migrants travel to engage in both skilled and unskilled economic activities. It was concluded that remittances of the receiving countries contributed positively and significantly to economic performance in West Africa because the remittances received are in building houses and other investments that improved economic performance within the region. While on the other hand, it was concluded that remittances of the sending countries had significant negative impact on economic performance of West African

region since it constituted leakages. The study further concluded that refugee population had significant negative impact on economic performance in West Africa given the nature of the refugee population who are often in distress conditions arising from the incidence of crisis or natural disaster that was the cause of their migration.

6.2 Recommendations

Recommendations for this study are outlined in line with the findings:

- i. The ECOWAS members should strengthen the movement protocol enshrined in the migration policy within the West African region. The strengthening can be achieved in the areas of promoting migrations of skilled and professional labour, by so doing, the disadvantaged countries within the region can afford to have skilled and professionals for improved economic performance.
- ii. On remittances of receiving countries, the receiving countries should earmark critical areas for investment that can be of benefit even in the long run. There should be deliberate policies to encourage emigrants to invest at home.
- iii. On remittances of sending countries, host countries should put in place policies and measures that forbid immigrants' outright repatriations of resources to avoid massive leakages that can adversely affect economic growth.
- iv. Host countries of refugee population should collaborate with the United Nations High Commissioner for Refugees (UNHCR) in providing special interventions that can improve the status of the refugee migrants to positively contribute to economic growth.

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