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A BIAS-CORRECTED METHOD OF MOMENTS APPROACH TO EXAMINING THE INFLUENCE OF REMITTANCES AND INSTITUTIONS ON MIGRATION IN SELECTED SUB-SAHARAN AFRICAN COUNTRIES

ABSTRACT

This study examined the effects of remittances and institutional quality on migration in thirty-four (34) sub-Saharan countries. Panel data analysis, specifically Bias Corrected Method of Moments (BC-MM) with random effects and robust standard errors, was used for analysis. The reason for using this method is that the BC-MM estimators are more efficient than GMM estimators in terms of correctly sized tests, and in tackling the Nickell bias that occurs in small samples and situations where T is small. The results of the analysis indicated that the effect of personal remittances on net migration is non-linear, that is, personal remittances has positive effect on net migration initially, and then, at the turning point, it has a negative effect on net migration. Institutional quality has a negative significant effect on net migration. Moreover, the influence of inflation on net migration is inconclusive. Unemployment has a positive significant effect on net migration. However, the interaction term of personal remittances and institutional quality has a positive and significant influence on net migration. Hence, this study recommends that policy makers should create enabling channels for the receiving remittances from abroad, provide incentives, and create enabling environment for investment. Governments should strengthen their institutions by enforcing law and order. The study is unique because it utilized the Bias-corrected method of moments (BC-MM), which is superior to GMM in terms of overcoming nickel bias and handling small samples with small T . The study included marginal effects analysis and threshold analysis.

Keywords: Bias-Corrected, Remittances, Migration, Institutions, Marginal Effects, Non-linear, Africa

Introduction

The issue of migration is age long and multifaceted. Net migration is used to measure the migration balance in various countries. Net migration also known as migration balance is defined by World Bank (2024) as the net total of migrants during a period, that is, the number of immigrants minus the number of emigrants, including both citizens and non-citizens. Migration can be either outwards or inwards, that is it can be either emigration or immigration. Emigration and immigration bring about benefit and costs in both sending countries and receiving countries.

The benefits gotten by emigrants include better living conditions, higher incomes, better education, remittances, democracy, etc. The costs usually include risks of unemployment as a result of search and matching process; disruption of family ties, racism, harsh migration policies in receiving countries. It is of paramount importance for the society, policy-makers, migrants and potential migrants to comprehend the forces that shape migration decisions. Individuals make these decisions at crossroads in their lives, moreover, these decisions determine and are determined by long-term life trajectories. The effects of these decisions are significant on the decision maker and the individuals that the decisions affect (Czaika, et al. 2021).

With a great focus on the United Nation (UN) Agenda 2030 for Sustainable, several nations and regions of the world define the reduction of inequalities and improving of welfare of labour forces as groundbreaking levels for future development (Kwilinski, et al. 2022). Moreover, in addressing the factors that determine the migration balance, a thorough examination of institutional variables arms us with more robust ideas as regards issues of human dignity (justice), and a more holistic knowledge of how tackle issues of human dignity (justice) and a sustainable climate in a better way. (Clark, et al., 2024).

The issue of rapid outflow of individuals from Africa have been a major concern. As at 2024, thirty-30 countries out of the thirty-four (34) sub-Saharan African countries included this study had negative value of net migration that is a negative value of the migration balance. The countries consist of Angola, Benin, Botswana, Burkina Faso, Burundi, Cape-Verde, Cameroon, Comoros, the Gambia, Ghana, Guinea, Guinea Bissau, Kenya, Lesotho, Liberia, Madagascar, Mozambique, Niger, Nigeria, Rwanda, Sao Tome, Senegal, Sierra Leone, South Africa, Tanzania, Togo, and Uganda. This implies that, in these countries, there was more outflow of people than inflow of people, that is, more emigration than immigration. Out of the thirty countries with negative value of net migration, eight(8) countries had positive value of net migration in 2017 but the value of net migration in each of those eight countries those countries turned to negative in 2024.

Despite the various policies and declarations made at national, regional and international levels to regulate migration, the issue of rapid regular and irregular emigration from African countries have persisted. Based on data from World Bank (2024), as at 2024, thirty-30 countries out of the thirty-four (34) sub-Saharan African countries selected for this study had negative value of net migration that is a negative value of the migration balance. Moreover, push factors such as inflation, low levels of income, insecurity, unemployment, etc. have been on the rise. Lack of political stability is also a prevailing problem and push factor in Africa, as a number of nations experienced coup d'état, protests, social conflict and class conflict, as seen in Nigeria, Kenya, Gabon, etc. Political instability often results in instability in macro-economic policies, which have adverse effects on the economy.

In addition, emigration from a country is a potential cause of brain drain in the particular sending country and, it leads to much pressure on resources and job opportunities in the receiving countries. It has also been negatively influencing migrants that follow irregular routes and means. Not many empirical studies on migration pointed out the effect of remittances, as a source of income, on net

migration. Besides, various studies on migration were country-specific, focused on financial factors, and employed static methods of estimation. Hence, this study will employ panel data analysis to examine the effect of remittances and institutional quality on net migration in thirty-four (34) sub-Saharan countries.

The structure of this article proceeds as follows: The first part is deals with the Introduction. The second part focuses on the Literature Review, which includes review of the relevant theory and empirical literature. The third part is concerned with the Methodology. The fourth part displays the results and discussions, and the fifth part presents the conclusion and recommendations.

Literature Review

Theoretical Framework

This study hinges on the Aspirations Capabilities Framework. According to de Haas (2021). aspirations–capabilities framework provides a clear understanding of human mobility as an intuitive part of the extensive processes of social change. This framework describes migration as a function of aspirations and capabilities to migrate, subject to certain geographical opportunity settings. It differentiates the instrumental dimensions of human migration (which views migration as a tool for achieving an objective), from the intuitive dimensions of human migration, which has direct impact on welfare. This further suggest that leaving and staying are seen as complementary expressions of migratory agency. Hence, human mobility explained as people’s capability to select the place they will live in, decide whether they will stay, which is not limited to the particular act of moving.

The most prevalent justification for the rising part of the migration curve is that rising income levels propel growing aspirations to go to another location seek opportunities that cannot be achieved at the place of origin. Meanwhile, with development the capabilities achieve such migration aspirations also rise (de Haas & Frankema, 2022).

The Aspirations-Capabilities framework is relevant because models the impact of personal remittances and institutions on migration in various ways. As individuals receive personal remittances from abroad, their income increases and this puts them in a better economic situation, which may lead to certain aspirations, even though they might not migrate immediately. However, as the personal remittances received reaches a certain threshold, the recipients might have the capability to turn the aspiration to migrate into reality. This might lead to a situation where there is decrease in the net migration or decrease in the migration balance, where outflow of people is greater than inflow of people in the particular country or region of the recipients. Moreover, when personal remittances interact with institutional quality, strong institutional quality may enhance the positive effect of personal remittances on net migration, which can be exhibited by less outflow of individuals because there are strong institutions making the country conducive, and they are also receiving remittances which boosts their incomes and solves their financial needs

Empirical Review

The literature on the impact of remittances and institutions on migration have yielded mixed results. Radić and Bogdan (2024) examined the causal relationships between FDI, remittances, emigration and economic growth in Croatia. It further analysed the relationship between emigration and remittances. The research utilised time series analysis and panel data analysis to study the intricacy of this phenomenon in a comprehensive manner. The findings of the above mentioned study revealed a bidirectional causal relationship between FDI and tourist growth, as demonstrated by the fact that remittances dictate emigration patterns, migration has a major impact on FDI, and tourism growth also increases remittance flows. This result is in consonance with Naiditch, et al. (2015), which demonstrated that remittances received by residents discouraged further emigration.

Some studies also explored dynamic models. For example, Naiditch, et al. (2015) examined the dynamic relationship between remittances and migration. That particular study employed an innovative epidemic modeling approach in finding out the manner in which remittances sent by migrants, have effect on subsequent migration flows. The results of the study mentioned above indicated that high remittances solevd the economic needs of recipients, thereby averting further migration. In addition to that, remittance levels can significantly modify emigration patterns.

Proving the non-linear relationship between remittances and migration, Sheng, et al. (2024) examined the effect of remittances on migration intentions and local socioeconomic development in politically unstable environments. The study employed regression analysis and the two-stage least squares (2SLS) method of analysis. The results showed that, although remittances have a positive immediate effect, in unstable socioeconomic situations remittances significantly increase migration intentions, thereby aiding recipients to cover travel costs and facilitating the departure of skilled workers. Hence, instead of boosting local development, remittances is linked to higher emigration and potentially depress local economic growth, as indicated by lower per capita GDP in such contexts.

Mussina, et al. (2026) utilised fixed effects and two-stage least squares (2SLS) methods of estimation to examined the effects of macroeconomic an institutional factors on net migration across countries with different levels of socioeconomic development. The results revealed that political stability has positive significant effect on net migration.

Grigoryan and Kalantaryan (2025) analysed emigration intentions in response to institutional changes in the South Caucasus during the period 2010–2013. Nationally representative household-level data was utilised. The findings of the study revealed that political elements like corruption, political instability, desecration of human rights, to a large extent, lead to migration.

Kwilinski et al. (2022) examined the causal relationships between international migration and the economic, social, political, and environmental development of selected European countries, covering eight EU member states and two potential EU candidates in Eastern Europe from 2000 to 2018. The study utilised panel data econometric methods including Fully Modified OLS (FMOLS) and Dynamic OLS (DOLS), alongside Granger causality. The results revealed significant effects of economic,

ecological, social, and political determinants on migration flows, thus proving the intricacy of migration as a multifaceted phenomenon.

The findings of Kwilinski, et al. (2022) are in consonance with Borjas (2019), which asserted that migration positively affects economic development when high-skilled labor is involved. In addition to this, the findings agree with by Pan et al. (2022) and Germani et al. (2021) in the aspect of the effects of environmental factors like pollution in migration decisions, and also agrees with Umit and Yaliniz (2013) in the aspect of social service pressures triggered by increasing migrant populations.

Various migration studies reviewed were country specific. In addition to this, many empirical works focused on the effects of income on migration, without specifically addressing the effect of remittances (as a source of income) on migration. Moreover, many studies did not examine the moderating effect of institutions on the impact of remittances on migration. This current study will fill this gap. Another gap in literature is the static models were used in many studies. This current study will fill this gap by utilising advanced and efficient model, specifically Bias Corrected Method of Moments (BC-MM).

Methodology

Types and Sources of Data

Panel data on net migration, personal remittances, political stability and absence of violence/terrorism, inflation rate, and unemployment rate across thirty-four (34) sub-Saharan African countries that were collected for a period of eight years (2017 to 2024). These countries include Angola, Benin, Botswana, Burkina Faso, Burundi, Cape Verde, Cameroon, Comoros, Cote d'Ivoire, Ethiopia, the Gambia, Ghana, Guinea, Guinea Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome, Senegal, Sierra Leone, South Africa, Tanzania, Togo, Uganda, and Zambia. The reasons for selecting these thirty-four (34) sub-Saharan African countries include the availability of migration data for these countries, and the fact that out of these thirty-four sub-Saharan countries, thirty-30 of these countries had negative value of net migration as at 2024, revealing the rapid emigration from sub-Saharan African countries.

Table 3.1: Measurement of Variables

S/N	Variable name		Abbreviation	Description	Source		A-priori Expectation
i.	Net Migration		NETMIG	Net migration is the number of individuals coming into a nation minus the number of individuals going out of the nation, comprising citizens and noncitizens.	World Indicators (2026)	Bank	
ii.	Personal received	Remittances	PREM	Personal remittances consists of personal transfers (from people residing in a foreign country to those in another country), and compensation of employees.	World Indicators (2026)	Bank	Positive (+)
iii.	Political Stability absence violence/terrorism (Estimate)	and of	PSAV	Political Stability and absence of violence/terrorism	World Indicators (2026)	Bank	Positive (-)
iv.	Inflation (CPI)		INF	Inflation, in terms of the consumer price index (CPI) depicts the annual percentage change in the cost to the average consumer of getting a basket of goods and services that may be unchanged or changed at definite intervals, such as from year to year.	World Indicators (2026)	Bank	Negative (-)
v.	Unemployment		UNEMP	Unemployment connotes the share of the labor force lack work but are ready to work, and seeking employment.	World Indicators (2026)	Bank	Negative (-)
vi.	GDP per capita		GDPPCAP	Gross Domestic Product Per Capita	World Indicators (2026)	Bank	Positive (+)

Source: Author's compilation (2026)

Model Specifications

The models to be used in this study is specified as:

$$\text{NETMIG}_{it} = \beta_0 + \beta_1 \text{NETMIG}_{i, (t-1)} + \beta_2 \text{PREM}_{it} + \beta_3 \text{INQ}_{it} + \beta_4 \text{INF}_{it} + \beta_5 \text{UNEMP}_{it} + \beta_6 \text{GDPPCAP}_{it} + \beta_7 (\text{PREM} * \text{INQ})_{it} + \epsilon_{it} \quad (1)$$

Where,

NETMIG = Net Migration, PREM = Personal remittances received, INQ = Institutional quality (Composite of Political stability and absence of violence/terrorism PSAV; Control of corruption CCOR; Regulatory quality REQ; rule of law RUL; voice and accountability VOA; and Government Effectiveness GOE), INF = Inflation, UNEMP = Unemployment, GDPPCAP = GDP per capita, PREM*INQ = Linear interaction of personal remittances with institutional quality.

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ = Parameters, ϵ = Error term, $i = 1, 2, 3 \dots N$ (Cross sections), and $t = 2017, 2018, 2019, \dots, 2024$ (time periods).

$$\text{NETMIG}_{it} = \beta_0 + \beta_1 \text{NETMIG}_{i, (t-1)} + \beta_2 \text{PREM}_{it} + \beta_3 \text{INQ}_{it} + \beta_4 \text{INF}_{it} + \beta_5 \text{PREM SQUARED}_{it} + \beta_6 (\text{PREM} * \text{INQ})_{it} + \epsilon_i \quad (2)$$

Where,

NETMIG = Net Migration, PREM = Personal remittances received, INQ = Institutional Quality (Composite of Political stability and absence of violence/terrorism PSAV; Control of corruption CCOR; Regulatory quality REQ; rule of law RUL; voice and accountability VOA; and Government Effectiveness GOE), INF = Inflation; PREM SQUARED = Quadratic term (square) of personal remittances, PREM*INQ = Linear interaction of personal remittances with institutional quality.

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ = Parameters

ϵ = Error term

$i = 1, 2, 3 \dots N$ (Cross sections), and $t = 2017, 2018, 2019, \dots, 2024$ (time periods).

Method of Data Analysis

This study employed the The Bias-Corrected Method of Moments (BC-MM), which is a computationally simple bias correction for linear dynamic panel data models. This method is flexible and can be used with other methods. Specifically, Fixed-effects and random-effects assumptions, heteroskedastic errors, as well as higher order autoregressive models can fit into this method. Moreover, Panel-corrected standard errors that allow for robust inference in dynamic models with cross-sectionally correlated errors can be gotten from the BC-MM. In addition to these, as proven by Monte Carlo experiments, under certain assumptions such as assumption of strictly exogenous regressors, the bias corrected method of moment estimator is far better than the popular GMM estimators in terms of efficiency and correctly sized tests (Breitung, et al. 2022). In addition, it has the capacity to correct the Nickell bias that occurs in small samples and situations where T is small.

According the Breitung, et al. (2022), the Bias-corrected method of moment is based the assumption that the errors u_{it} are independent across i and t with $E[u_{it}] = 0$ and $E[u_{it}^2] = \sigma_{it}^2 < C$ for some constant $C < \infty$. Moreover, the regressors are strictly exogenous with $E[x_{it}u_{is}] = 0$

Results and Discussion

Table 1: Results of Model 1 and Model 2

Dependent Variable: NET MIGRATION

	BC-MM with Fixed Effects	BC-MM with Random Effects	BC-MM with Random Effects and Robust Standard Errors (Model 1)	BC-MM with Random Effects and Robust Standard Errors (Model 2)
Constant	5.5303 (1.44)	7.0350 (3.29)***	7.0350 (3.29)***	4.3015 (2.76)***
Lagged dependent variable	0.5744 (1.84)*	0.4211 (2.28)**	0.4211 (2.28)**	0.5643 (4.37)***
log_PREM_centered	0.0057 (0.41)	-0.0005 (-0.07)	-0.0005 (-0.07)	-
log_PREM	-	-	-	0.0930 (3.15)***
log_PREM_squared				-0.0021 (-2.38)**
INQ_centered	0.0554 (0.61)	0.0078 (0.32)	0.0078 (0.32)	-
INQ	-	-	-	-0.8618 (-2.03)**
INF	-0.0008 (-0.58)	-0.0010 (-1.51)*	-0.0010 (-1.51)*	0.0001 (0.16)
UNEMP	0.0065 (0.74)	0.0102 (2.90)***	0.0102 (2.90)***	-
log_GDPPCAP	-0.0575 (-0.94)	-0.0107 (-0.46)	-0.0107 (-0.46)	-
log_PREM_centered*INQ_centered	0.0504 (1.39)	0.0632 (2.55)**	0.0632 (2.55)**	-
log_PREM *INQ	-	-	-	0.0471 (2.04)**
Observations	238	238	238	238

Joint Wald Test (for PREM*INQ)	-	-	0.0106	0.0413
Overall Wald Test	-	-	0.0003	0.0000
Hausman Test	0.6923	0.6923	0.6923	0.7924
Serial Correlation Test	0.7700	0.7464	0.7464	0.6231
Hansen Test for over-identifying restrictions	-	0.9201	0.9201	0.9009
Mean VIF	1.63	1.63	1.63	-
Heteroskedasticity	-	-	-	-
Marginal Effects of Personal Remittances (log_PREM) at mean				
dy/dx	-	-	-	0.0674
Delta-method standard error	-	-	-	0.03407
z statistic	-	-	-	(1.98)**
Threshold Analysis for Personal Remittances (log_PREM)				
Threshold/turning point	-	-	-	22.1190
z-statistic	-	-	-	(5.12)***
Shape of curve	-	-	-	Inverted-U-shape (Hump Shape)

Note: Figures in the parenthesis are t-statistics, except for Joint Wald test, Overall Wald Test, Hausman Test, Serial Correlation tests and Hansen J Test which are p-values.

*, ** and *** indicate the respective levels of significance, 10%, 5% and 1% significance levels, respectively.

Source: Author's Computation (2026).

The results of Model 1 revealed that the lagged dependent variable has a positive and statistically significant effect on net migration. The result of Institutional quality on net migration is also inconclusive. The effect of inflation (INF) on net migration is inconclusive as the coefficient is significant at only 10 percent.

Unemployment has a positive and statistically significant impact on net migration. This means increase in unemployment leads to increase in the migration balance. This finding is consistent with Fendel (2014), which asserted that the unemployed are less likely to migrate because of the costs of migration for the unemployed exceed the benefits. This result is also in consonance with DeWaard et al. (2012) which established that when the effect on income overshadows the spatial substitution effect, unemployment is likely to lead to decline in migration, which is as a result of poverty constraints. The result also agrees with Mussina, et al. (2026) which asserted that unemployment has a positive effect on net migration.

The results of Model 2 reveal that lagged dependent variable has a positive significant effect on log net migration. This result suggests that migration flows tend to exhibit continuity over time, whereby areas that experienced higher migration in the past are likely to continue attracting migrants in subsequent periods.

The linear term of personal remittances (PREM) have effect and net migration. This positive effect of the linear term of log_PREM implies that increase in personal remittances (PREM) contribute to higher immigration into the country initially. However, the presence of both a squared term and an interaction term involving PREM indicates that the effect is not constant across all levels of PREM and INQ. In the aspect of the initial effects of remittance on emigration, this agrees with Naiditch, et al. (2015) high remittances fulfil the economic needs of recipients, thereby preventing additional migration in initial stages.

However, the coefficient of the squared (quadratic) term, log_PREM_squared, is significant and negative. This reveals the existence of a nonlinear relationship between PREM and net migration. The negative sign of this coefficient indicates that the positive effect of PREM on migration weakens as PREM increases. The result of the threshold analysis in model 2b shows that the relationship between personal remittances received (PREM) and net migration NETMIG demonstrates a non-linear, threshold pattern, where personal remittances received initially increases net migration but decreases it after reaching a turning point of 22.11891, which is among the values in the range of the analysed data. This means that once log personal remittances received (log_PREM) reaches a value of 22.1190, it reaches the peak of the inverted-U shaped curve, where the increase stops and the decrease starts. That is, the direction of the effect changes. Hence, the effect of personal remittances received on net migration becomes negative. This means that net migration stops increasing and it starts decreasing. This further implies that emigration starts to increase while immigration decreases.

This is possible because at the early stages, when residents of a country start receiving remittances from abroad, their economic conditions improve, and they may decide to invest, and investments lead to development. Hence, emigration will still be on the decline. However, at a certain point, as personal remittances received continue to increase, these residents will be able to afford the financial cost of migration, hence; they will emigrate from the country, in a quest to fulfil their aspirations and also to build more wealth by getting it directly from the source.

The possibility of emigration will also be high because their relatives or friends abroad have already built a network and have information about job opportunities and vacancies. The result is also in agreement with Sheng, et al. (2024) which revealed that although remittances have a positive immediate effect, in unstable socioeconomic situations, remittances significantly increase migration intentions, thereby aiding recipients to cover travel costs and facilitating the departure of skilled workers. This surprisingly implies that, instead of boosting local development, increase in remittances leads to with higher emigration.

The interaction therefore demonstrates that these two variables jointly influence migration. The aspect of this result dealing with the initial effect of institutional quality, that's the effect of the linear term of institutional quality aligns with Mussina (2026) which indicated a positive effect of political stability (which is an institutional quality indicator) on net migration. It is also in agreement with Feld (2021) which, asserted that decrease in institutional quality, which is exhibited in the form of political instability and economic disorders interrupt the free movement of individuals and capital, thereby restricting migration and remittance flows.

In both Model 1 and Model 2, the interaction of personal remittances with institutional quality has a significant positive effect on net migration. This implies that institutional quality moderates the positive effect of personal remittances on net migration. The findings of this study is in agreement with Sheng, et al. (2024) which hints that institutional quality moderates the effect of remittances on migration. Sheng, et al. (2024) asserted that in unstable socioeconomic situations remittances significantly increase migration intentions. Unstable socioeconomic situations reflect declining institutional quality. However, stable socioeconomic situations reflect improving institutional quality. Hence, increase in institutional quality strengthens the positive effect of personal remittances on net migration.

Conclusion and Recommendations

The findings of this study revealed that Personal remittances has a non-linear effect on net migration, that is , it has a positive significant effect on net migration initially, but at the turning point, the effect of personal remittances on net migration becomes negative. Institutional quality has a negative significant effect on net migration. Inflation has a negative non-significant effect on log net migration. Unemployment has a positive significant effect on net migration. The interaction term of personal remittances and institutional quality has a positive significant effect on net migration.

Based on the finding that personal remittances has a non-linear effect migration, that is positive effect initially and negative effect later on; this study recommends that policy makers should create enabling channels for the receiving remittances from abroad. They should also provide incentives in forms of favourable taxes, subsidies, and grants that will encourage recipients of remittances to invest in the home country, instead of using the money to cover the cost of emigration.

Based on the findings that indicate that the interaction term of personal remittances and institutional quality has a positive significant effect on net migration, the study recommends that in order to encourage immigration and discourage emigration, the governments should strengthen its institutions by enforcing laws that makes the country safe for investment. These include rewarding honest practices, eliminating bureaucratic bottlenecks, ensuring fairness, and punishing lawbreakers.

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