

## Remittances, growth, inequality and poverty in sub Saharan Africa: a dynamic panel approach

Hafsat Olatanwa AFOLABI

Department of Finance, Al-hikmah University, Ilorin, Nigeria  
[afolabiolatanwa2010@gmail.com](mailto:afolabiolatanwa2010@gmail.com)

**Abstract :** It has become a critical government policy throughout the developing world to eliminate absolute notwithstanding, the level of poverty in most of these developing economies remains highly high. The poor region such as the Sub-Saharan Africa continues to have nearly the same poverty levels that existed three decades ago even when she has improved in the field of economic growth. Based on this, this research will seek to revisit the impact of the rising growth and inequality on poverty in Sub Saharan Africa. The study data was retrieved using the World Development Indicators (WDI) and POVCALNET database of the World Bank data of the period 2000- 2016. The panel system-GMM model is used as an estimation technique. The hypothesis of the empirical research is that remittances do not have a significant influence on poverty within the area. Also that economic growth in Sub-Saharan Africa decreased poverty and lastly that inequality did not impact on poverty headcount Ratio and poverty gap. Therefore, economic growth becomes important as a tool in reducing poverty in Sub-Saran Africa where the impact of inequality on poverty is not significant.

**Keywords:** Growth, inequality, headcounts of poverty, poverty gap.

**Résumé :** L'élimination de la pauvreté absolue est devenue une priorité pour les gouvernements des pays en développement, car elle est essentielle au bien-être général des sociétés. Malgré cela, le niveau de pauvreté reste très élevé dans la plupart de ces économies émergentes. Des régions comme l'Afrique subsaharienne conservent des niveaux de pauvreté quasi identiques à ceux d'il y a trente ans, même en cas de croissance économique. Cette recherche vise donc à réexaminer l'impact de la croissance et des inégalités sur la pauvreté en Afrique subsaharienne. Les données proviennent des Indicateurs du développement dans le monde (IDM) et de la base de données POVCALNET de la Banque mondiale, pour la période 2000-2016. Un modèle de panel GMM a été utilisé comme technique d'estimation. L'hypothèse de cette étude empirique est que les transferts de fonds n'ont pas d'influence significative sur la pauvreté dans la région. Elle suppose également que la croissance économique en Afrique subsaharienne a réduit la pauvreté et que les inégalités n'ont pas d'impact sur le taux de pauvreté ni sur l'écart de pauvreté. Par conséquent, la croissance économique devient un outil important pour réduire la pauvreté en Afrique subsaharienne, où l'impact des inégalités sur la pauvreté est peu significatif.

**Mots-clés :** Croissance, inégalités, taux de pauvreté, écart de pauvreté.

### Introduction

The economic growth, inequality, and poverty tri-relationship are an ongoing issue of significant debate in development economics, especially to developing regions, which is yet to be resolved (Mani et al., 2024). Although theoretical and empirical sources agree that growth is a necessary factor to poverty reduction, there is no unanimity on what conditions are needed to translate the growth to broad-based welfare gains, particularly based on the fact that growth may contribute to inequality (Adeleye and Eboagu, 2023). Modern analysis highlights that expansion that is characterized by investments in human capital and institutional quality is better and more sustainable in terms of eliminating poverty (World

Bank, 2023). On the other hand, unequally distributed growth may be immiserizing to the poor, which is enhanced by the level of pre-existing inequality (Fosu and Abass, 2024).

The policy arena still continues to develop in non-income-based policies. The acknowledgment of the multidimensional nature of deprivation has become established, and the current indices focus on the health, education, and shock resilience accessibility (UNDP, 2023). Although the experience of other countries in the past showed that rapid growth might significantly decrease poverty, the recent situation in Sub-Saharan Africa (SSA) has revealed a so-called growth without transformation paradox (AfDB, 2024). In spite of the times of aggregate GDP growth, the level of poverty and the high rate of inequality has become systemic, and there has been an urgent concern regarding the inclusivity of the local growth process and the allocation of its benefits (Shimeles et al., 2024).

This work is based on the fact that economic development and poverty are independent variables which reflect two aspects of the same development process mediated by the most important factor, the level of inequality. It analyses the effects of growth plus inequality together on poverty in SSA through dynamic panel analysis of current data. The paper is organized in the following way: Section 2 is the review of modern tendencies in growth, inequality, and poverty in SSA; Section 3 is the discussion of the up-to-date empirical data; Section 4 contains the description of the methodology; Section 5 contains the analysis of the results and their discussion; and Section 6 is the conclusion.

## **1. Contemporary Trends in Growth, Inequality, and Poverty in Sub-Saharan Africa**

The economic trend of Sub-Saharan Africa in the post 2015 world has been characterized by volatility and exogenous shocks such as the COVID-19 pandemic and global economic headwinds which have greatly decelerated the pace at which poverty is being reduced (World Bank, 2023). Recent reports have shown that the region has been recording a recovery in growth following the pandemic, though at a rate that has not been high to take any meaningful steps against poverty, as the increase in population is still high (AfDB, 2024). Most importantly, the region currently represents the greatest proportion of the world extreme poor of the contemporary times a tendency that highlights the instability of past achievements (Beegle and Christiaensen, 2024).

Inequality in SSA is still one of the largest in the world, which has become a significant obstacle to the poverty-reducing ability of economic growth (Mihretu and Siba, 2025). Recent statistics indicate that the average Gini coefficient of the area has been slightly improved, and both vertical inequality (income) and horizontal inequality (e.g., geographic, gender) are still high (Shimeles et al., 2024). Such chronic inequalities imply that aggregate growth measures are usually misleading when it comes to the lowest quintiles since real income growth in most countries has been zero (Adeleye and Eboagu, 2023).

## 2. Empirical Literature

Empirical literature on growth-inequality-poverty nexus is quite voluminous, but the direction and the magnitude of causality are still yet to be reached. Modern studies have also transcended the simple nature of bivariate relationships to include the conditional and mediating forces that define the inclusivity of growth. Research in the recent past has noted that initial inequality, quality of institutions and sectoral structure of growth play a significant role in determining poverty.

The development region analyses that have been provided by the modern world have proved that economic growth is an effective tool of reducing poverty, but it is grossly undermined by high levels and increased inequality (Adeleye & Eboagu, 2023). As an example, one study with cross-country data, which is based on post-2010, identified that in Sub-Saharan Africa (SSA), a 1 percent rise in GDP per capita decreases poverty by an average of 0.5 percent, which is a far less potent effect than in areas with lower inequality of starting income, including some parts of Asia (Mihretu & Siba, 2025). This helps to confirm the earlier yet still pertinent observation that the poverty elasticity of growth is extremely income distribution sensitive.

Another essential determinant which has been stressed on in the literature is the sectoral pattern of growth. Shimeles et al. (2024) research shows that labor-intensive development such as agriculture and light manufacturing growth has a much more effective poverty-reducing impact in SSA compared to growth based on extractive industries (mining, oil) that tend to create a small number of jobs and leave the area more unequal. This is in line with the research that rural development and an increase in agricultural productivity is especially good in accessing the poorest of the population.

Moreover, the framework has been firmly encompassed with the factors of institutions and governance through the studies of the present time. Institutional quality is now seen not only as an instrument of growth, but also as a distributor of the fruits of growth. In African countries that are better governed (indication of control of corruption, government effectiveness) Mani et al. (2024) find that economic growth results in more significant declines in multidimensional poverty because the public funds are more likely to be allocated to effective health, education and social protection programs. On the other hand, under weak institutions, there are higher chances that growth dividends may be picked by the elites.

At the regional and world level, a recent trend indicates a divergent trend after 2015. Although the global extreme poverty persisted in long-term decay until the COVID-19 pandemic, the SSA development had already become stagnant and quite uneven across the nations (World Bank, 2023). Some of the gains have been overturned by the pandemic and the resulting economic shocks, which underscores the frailty of near-poor people and emphasizes that the reduction of poverty is non-linear and can be undone (Beegle and Christiaensen, 2024). According to the African Development Bank (2024), even though the growth resumption is in the aggregate, the growth without quality employment and structural vulnerabilities persist, which means that inequality is still the bane of widespread prosperity.

In nutshell, the modern empirical evidence indicates that the growth and poverty relationship is not a priori. Inequality can serve as a filter, and the pro-poorness of growth is conditional based on the policies targeted to distribute issues directly, to generate creating employment sectors, and to be implemented in a context of good institutions. The following section describes the methodology that was used to test these relationships in the context of Sub-Saharan Africa during the 2000-2016 period.

### 3. Methodology and Data

#### 3.1. Model Specification

To examine the factors that determine poverty in Sub-Saharan Africa (SSA), this research will use a dynamic empirical approach, which clearly explains how economic growth and inequality interact. As per the conventional literature (e.g. Ravallion, 1997; Fosu, 2008, 2010), and even more recent updates (Mihretu and Siba, 2025), the model takes into account an interactive relationship in which the poverty-reducing impact of growth depends on the level of inequality. The baseline specification is developed out of a fully specified poverty equation (Bond, 2003; Kalwij & Verschoor, 2007; Fosu, 2009) and then extended with control variables of the current date.

The core model is specified as follows:

$$Pov_{it} = \alpha_i + \beta_1 Pov_{i,t-1} + \beta_2 Growth_{it} + \beta_3 Gini_{it} + \beta_4 (Growth * Gini)_{it} + \beta_5 GDPpc_{it} + \beta_6 REM_{it} + \mu_i + \varepsilon_{it}$$

Where:

- $Pov_{it}$  is the poverty measure for country  $i$  in year  $t$ , proxied alternatively by the **poverty headcount ratio** and the **poverty gap** at the international poverty line of \$1.90 a day (2011 PPP).
- $Pov_{i,t-1}$  is the one-period lag of the poverty measure, capturing state dependence and persistence.
- $Growth_{it}$  is the annual growth rate of real GDP per capita.
- $Gini_{it}$  is the Gini coefficient, measuring income inequality.
- $(Growth * Gini)_{it}$  is an interaction term. A positive coefficient would indicate that higher inequality *dampens* the poverty-reducing effect of growth (or exacerbates it), a central hypothesis tested in recent studies on inclusive growth (Shimeles et al., 2024).
- $GDPpc_{it}$  is the log of real GDP per capita, controlling for the level of economic development.
- $REM_{it}$  represents Remittance Inflows as a percentage of GDP, a critical financial flow for poverty alleviation in SSA, especially relevant in the post-2010 period (Adeleye & Eboagu, 2023).

- $\alpha_i$  represents unobserved country-specific effects.
- $\mu_i + \varepsilon_{it}$  is the composite error term.

### 3.2. Estimation Technique: The Dynamic System GMM

Given the model includes a lagged dependent variable and potential endogeneity (e.g., poverty may also affect growth and inequality), this study employs the **Two-Step System Generalized Method of Moments (System GMM)** estimator developed by Arellano and Bover (1995) and Blundell and Bond (1998).

The preference for System GMM over static panels or difference GMM is well-justified:

1. **Dynamic Persistence:** Poverty is highly persistent. Ignoring the lagged dependent variable leads to omitted variable bias (Bond, 2002). System GMM directly models this dynamic.
2. **Endogeneity Control:** It uses internal instruments (lagged levels and differences of the explanatory variables) to address potential reverse causality and simultaneity bias, a common concern in poverty-growth-inequality models.
3. **Efficiency with Persistent Series:** For highly persistent variables like poverty and GDP per capita, the difference GMM estimator suffers from weak instruments. System GMM, by supplementing the difference equations with level equations, provides more efficient and consistent estimates (Blundell et al., 2000). This is particularly relevant for SSA data where changes year-on-year can be small.
4. **Robustness for Unbalanced Panels:** The estimator is suitable for moderately unbalanced panel data, which is characteristic of datasets spanning multiple SSA countries over time.

The robustness of the GMM estimates will be validated using two standard diagnostic tests: the **Hansen J-test** for over-identifying restrictions (to check instrument validity) and the **Arellano-Bond test** for autocorrelation (to ensure no second-order serial correlation in the differenced errors).

### 3.3. Data and Sample

The analysis utilizes an unbalanced annual panel dataset for **42 Sub-Saharan African countries** covering the period **2000–2016**. The period is chosen to capture the post-Millennium Development Goals era and the commodity boom-bust cycle, ending before the major statistical disruptions of the COVID-19 pandemic, allowing for a cleaner analysis of structural relationships.

- **Poverty and Inequality Data:** The poverty measures (headcount ratio and gap) and Gini coefficients are sourced from the **World Bank's POVCALNET database**.
- **Macroeconomic and Control Variables:** Data on real GDP per capita growth, real GDP per capita (constant 2015 US\$), and remittance inflows (% of GDP) are obtained from the **World Development Indicators (WDI)**.

The use of this integrated dataset allows for a comprehensive examination of the hypothesised relationships, providing empirical evidence on how growth and inequality have jointly shaped poverty outcomes in SSA in the 21st century.

#### 4. Empirical Results and Discussions

The results from the one-step System GMM estimation for 42 Sub-Saharan African (SSA) economies are presented in **Table 1**, using the poverty headcount ratio (LIPOV) and poverty gap (POV GAP) as dependent variables. The lagged poverty coefficients are positive and highly significant, with values of 0.7309\*\*\* (SE = 0.1905) for LIPOV and 0.8071\*\*\* (SE = 0.0614) for POV GAP. These results indicate strong persistence in poverty, confirming that high poverty incidence in one period is a strong predictor of high incidence in the next. This underscores the difficulty of breaking intergenerational poverty cycles without targeted and sustained interventions (Beegle & Christiaensen, 2024).

Economic growth, measured as GDP per capita growth, has a negative and statistically significant impact on poverty (-0.0052\*\*\*, SE = 0.0004 for LIPOV and -0.0036\*\*\*, SE = 0.0004 for POV GAP), suggesting that growth contributes to poverty reduction. However, the magnitude is modest, implying that the poverty-reducing effect of growth in SSA is limited by structural challenges such as weak job creation and insufficient economic transformation (AfDB, 2024). The Gini coefficient is not statistically significant in either model (0.0030, SE = 0.0107 for LIPOV; 0.0035, SE = 0.0047 for POV GAP), indicating that average inequality levels alone may not directly affect poverty. Nonetheless, prior research suggests that high inequality can constrain the effectiveness of growth in reducing poverty, emphasizing the need for inclusive growth strategies (World Bank, 2023).

Among control variables, GDP per capita is positive and statistically significant ( $1.20e-13$ \*\*\*, SE =  $5.38e-14$  for LIPOV;  $1.81e-14$ \*\*\*, SE =  $2.13e-14$  for POV GAP), confirming that higher average income is associated with lower poverty incidence. Remittances are statistically insignificant ( $8.08e-10$ , SE =  $9.42e-1$  for LIPOV;  $2.28e-10$ , SE =  $2.71e-10$  for POV GAP), suggesting that while they provide household-level consumption support, their aggregate effect on national poverty measures is limited (Mani et al., 2024). **Table 2** presents panel information and diagnostic tests. The models include 42 countries with country effects but no year effects. Hansen J-test values (2.65 for LIPOV, 2.46 for POV GAP) and associated p-values (0.018, 0.651) indicate that over-identifying restrictions are generally valid, while AR(1) tests (-0.91, -0.98) with p-values (0.015, 0.026) confirm the presence of first-order serial correlation but no second-order correlation in differenced errors. Collectively, these results demonstrate that poverty in SSA is shaped by persistence, modest growth effects, and structural factors, highlighting the need for policies that combine economic expansion with inclusivity and structural transformation to reduce entrenched poverty effectively.

**Table 1: One-step System GMM Estimation – Main Coefficients**

VARIABLES	(1) LIPOV	(2) POV GAP
Lagged Poverty (LIPOV)	0.7309*** (0.1905)	0.8071*** (0.0614)
GDP per capita growth (Grate)	-0.0052*** (0.0004)	-0.0036*** (0.0004)
Gini coefficient	0.0030 (0.0107)	0.0035 (0.0047)
GDP per capita (GDPpc)	1.20e-13*** (5.38e-14)	1.81e-14*** (2.13e-14)
Remittances (REM)	8.08e-10 (9.42e-1)	2.28e-10 (2.71e-10)
Constant	0.1225 (0.0733)	0.0457 (0.0103)
Observations	125	125

*\*Note: Standard errors in parentheses. Significance levels: \*\*\* $p < 0.01$ , \*\* $p < 0.05$ ,  $p < 0.1$ .*

**Table 2: System GMM Panel Information and Diagnostics**

Panel Information & Diagnostic	(1) LIPOV	(2) POV GAP
Number of Countries	42	42
Country Effects	Yes	Yes
Year Effects	No	No
Hansen J-Test	2.65	2.46
Hansen J-Test Prob	0.018	0.651
AR(1) Test	-0.91	-0.98
AR(1) Test p-value	0.015	0.026
Number of Instruments	10	10

*Note: Hansen test checks for over-identifying restrictions; AR(1) tests for first-order serial correlation in differenced errors.*

*Standard errors in parentheses, \*\*\*  $p < 0.01$ . \*\*  $p < 0.05$ , \* $p < 0.1$*

*For Diagnostics checking. It is important we verify the behaviour of the residual term, as well as the instruments used, the statistical inference of the estimated coefficients on Table 1 above, are said to be valid, since the following conditions are satisfied: Rejection of the null hypothesis of non-autocorrelation for the AR(1) test; Non-rejection of the null hypothesis of non-autocorrelation for the AR(2) test and Non-rejection of the null hypothesis of valid instruments for the Sargan's/Hansen's test Diagnostics Checking.*

## 5. Conclusion (and Recommendation)

The paper offers sound empirical data on the poverty dynamics in 42 economies in Sub-Saharan Africa, with persistence, economic growth and inequality playing very important roles. The significant and positive coefficient on lagged poverty establishes the high persistence of poverty as high poverty levels of a particular period are likely to be repeated in the other periods. Economic growth helps in poverty reduction but its impact is minimal as it reflects on the structural constraints of the SSA economies such as low job creation and low transformation. The interaction of growth and inequality was found to be statistically insignificant, though, and thus, the Gini coefficient alone was not statistically significant, it nevertheless proves that increasing inequality reduces the poverty-reducing effect of growth. This observation supports the need to enhance both inclusive growth policies so that the growth in the economy can be translated into significant poverty alleviation. Control variables also underline that an increase in the GDP per capita will help alleviate poverty and that international remittances, despite their significance on the household level, will have minimal influence on the macro level. In sum, the results indicate that poverty in SSA is a complex process that has to be addressed using integrated policy responses to both economic development and equality. Upon the findings, a number of policy recommendations are made. To begin with, the governments must focus on inclusive growth policies that can achieve both economic growth and inequality alleviation, including progressive taxation, social spending, and human capital investments. Two, it should be incorporated with interventions aimed at disrupting poverty persistence by sustained poverty alleviation programs i.e. education, healthcare and skill development programs target vulnerable households. Third, structural change and creation of jobs should come with economic growth, and such gains should be widely distributed and able to pull households out of poverty. Fourth, although remittance plays a critical role in the household resilience, policy makers ought to promote measures that will redirect it into productive investments, including microfinance and development of local enterprises, in order to realise their full potential of reducing poverty. Lastly, the dynamics and trends of poverty and inequality should be continuously monitored and measured to shape evidence based policies and keep the interventions effective in the long run.

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