

Impact of Poverty and Inequality on Economic Growth In East Africa

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ABSTRACT

*The primary aim of this study is to evaluate how a group of selected countries align with the theoretical expectations regarding **the impact of poverty and inequality on economic growth**. The study conducted an econometric analysis through using panel data that were collected **for 6 east African developing** countries over period **2015-2024** to determine how poverty and inequality affect economic growth in these countries. The data was analyzed using **fixed effect model**. The study used population below poverty line, Gini index, and GDP per capita as indicators of for poverty, inequality, and economic growth respectively. The study employed Gross capital formation, investment rate, and population growth rate as control variables data was collected from **World Bank indicators** and other known **websites sources**. The study discussed the resulst by using both descriptive and regression results to draw the conclusion and to indicate future direction through recommendations.*

Keywords:-Poverty, inequality, economic growth, interplay

1. Background of the Study

The global economy grows continuously; through the pattern of that expansion vary across periods and countries. Growth is motivated by technological changes, improvement in resource use efficiency and capacity, and the generation of material wealth. However, economic downturns, crises and other shocks can cause negative growth in certain regions and countries. The East Asian financial crisis and continued negative growth in parts of sub-Saharan Africa are examples. Significant disparities and negative growth rates weaken economic integration and social stability, hindering the long-term economic growth.

Economic growth is a powerful gadget for poverty reduction and improving living standards developing countries. Growth can create a righteous cycle of prosperity and opportunity; healthy growth and expanded employment raise parents' incentives to invest in their children's education, which can foster a growing class of entrepreneurs, who, in turn, push for better governance. Thus, strong and continuous growth promotes human development, which then supports further economic progress. However, similar growth rates can produce very different outcomes of poverty, job prospects for poor, and other human development indicators depending

on situations. The poverty reducing impact of growth largely depends on how much the poor are able to take participation and benefit from that growth. Therefore, both the speed and pattern of growth are very important for reducing poverty (Aijaz and Tajamul, 2018).

Poverty and inequality represent two of the most persistent challenges confronting developing nations, significantly influencing the trajectory of economic growth. Poverty characterized by insufficiency of resources to meet basic needs, restricts individuals' access to education, healthcare, and productive employment, thereby diminishing human capital investments essential for sustainable growth. Inequality, often manifesting in uneven distribution of income and wealth, further undermine economic potential by limiting social mobility, reducing aggregate demand, and exacerbating social tensions that can destabilize markets and institutions. Empirical studies suggest that high levels of inequality can reduce innovation, restrict efficient allocation of resources and constrain long-term growth prospects, whereas more equitable societies tend to experience stronger and more inclusive economic development. Grasping the complex relationship among poverty, inequality, and economic growth is essential for making policies that both increase overall economic performance and make sure growth benefits are widely distributed, thereby supporting resilience, social cohesion, and lasting prosperity (N sadekin et al., 2021).

Poverty is a complex, multidimensional concern that affects people and communities around the world. It is commonly characterized by insufficient resources to satisfy basic needs- food, shelter, clothing, healthcare, and education. Poverty also includes social, political, and psychological aspects beyond material deprivation. It can delay economic growth by limiting the accumulation of human capital through poorer healthcare and reduced educational attainment. High levels of malnutrition, especially in developing countries, are very related to poverty (Cerra et al., 2021).

Income inequality describes how income is distributed unevenly across a population, with small segment holding a large share of wealth while others receive much less. It is often measured by the Gini index, which runs from 0 (complete equality) to 1 (maximum inequality). Economic growth represents an increase in country's output of goods and services, usually followed by GDP growth. Even though growth signals greater national prosperity, it does not guarantee that gains are shared evenly across the population. Therefore, policymakers must understand the relationship between income inequality and economic growth to build inclusive, sustainable economies that can benefit all society (Kozul-Wright, 2019).

The Kuznets curve Hypothesis is a graphical model illustrating the linkage between economic growth and income inequality. It proposes an inverted U-shaped pattern: as GDP per capita rises, income inequality first increase, the ultimately decline.

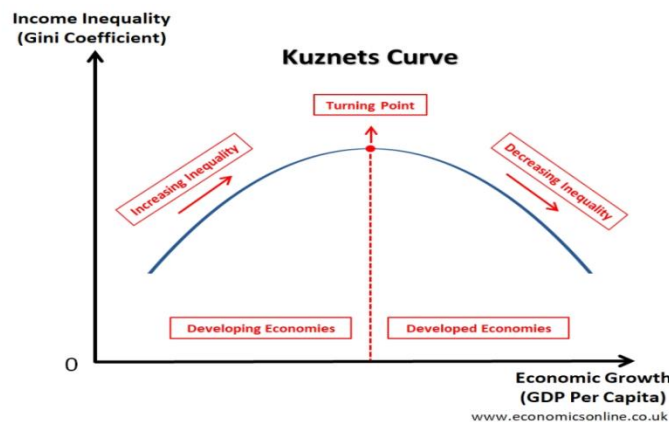


Figure 1: Kuznets Curve

The initial phase

The initial part of the Kuznets curve depicts low income inequality in countries with low GDP per capita. This reflects the tendency of poorer, agriculturally dominated economies to have a relatively even distribution of income among their population.

The Rising phase

The rising segment of the Kuznets curve demonstrates that as an economy grows and shifts from agriculture to industry, income inequality tends to broaden. Increased economic activity creates more investment opportunities for those who already own capital, allowing the wealthy to expand their assets. At the same time, rural workers migrate to urban areas; swelling the urban labor supply and overwhelming wages for low-skilled labor force. Such like dynamics widen the gap between rich and poor, raising income inequality. Therefore, the early rise in income inequality can be outlined to factors like wealth concentrating among a small elite group, uneven access to resources, and urbanization.

The Turning Point

The turning point shown on the Kuznets curve denotes the peak of income inequality. It appears at a specific level of per capita income often called the "Kuznets threshold," at which inequality is highest. The income level where this peak occurs can vary across countries.

The decreasing phase

After the turning point, the downward part of the Kuznets curve demonstrates that further rises in GDP per capita are associated with falling income inequality. This decline often attends structural shifts like deindustrialization and expansion of service sector, as the gain from growth begin to reach lower-income groups. Factors like access to education, progressive tax systems, and the government social programs can contribute to this reduction. Hence, sustainable economic growth eventually leads to a more equitable distribution of income.

2. Statement of the Problem

National development seeks to attain lasting macroeconomic objectives, such as full employment, price stability, sustained high growth, and balanced external account. Growth should not be simply raising the total size of output; it should also enhance broad welfare by reducing poverty and inequality. Thus, raising overall well-being requires both stronger economic growth and a more equitable distribution of income. (Olabisi et al., 2020).

Numerous studies have explored the relationship between poverty, inequality, and economic growth at both national and cross-country levels, utilizing time series and panel data (Amposah and Agbola, 2023; Marie et al., 2022; Carre et al., 2021). Additionally, research has focused on the effects of poverty and inequality on economic growth (Marrero and Serven, 2021). However, there are relatively few studies addressing these issues specifically in developing countries, particularly in East Africa, where challenges like poverty traps and uneven resource distribution persist. Although East Africa has recorded significant economic growth in recent years, poverty and inequality remain persistent challenges. This raises critical questions about whether growth in the region is truly inclusive and sustainable. Existing literature often focuses on global or continental trends, leaving a gap in region-specific analysis. **So, a key research gap** is that there is insufficient research on regional variation within East Africa countries which is contextual gap. Therefore, this study aims to investigate how poverty and inequality impact economic growth patterns in selected East African countries. By doing so, the study will provide valuable insights for policy makers and development practitioners, highlighting the importance of addressing social disparities as a means of fostering long- term economic progress by answering the following research questions

1. How do poverty and income inequality influence economic growth in developing countries?
2. Through what mechanisms do poverty and inequality affect economic growth?
3. What are the non-linear effects of poverty of poverty and inequality on economic growth?

3. Objectives of the Study

3.1 General Objective

To investigate the overall impacts of poverty and inequality on economic growth in East Africa

3.2 Specific Objectives

1. To assess influence of poverty and inequality on economic growth
2. To identify the mechanisms through which poverty and income inequality are affects economic growth
3. To examine the potential non-linear effects of poverty and inequality on economic growth.

4. Review of Related Literature

4.1. Key concepts related to Growth, Poverty, and Inequality

Linkages between Poverty, Inequality and Growth

Reducing poverty has been recognized as one of the most urgent problems facing the world. Without first tackling the issue of ongoing financial and economic opportunity disparities that exist among people, societies, and nations, poverty cannot be eliminated. This suggests that economic expansion or better income distribution can lower poverty. Although increased economic growth may result in a decrease or increase in inequality, it does not always imply a reduction in poverty.

Poverty-Growth-Inequality Triangle theory:-This concept holds that shifts in a country's poverty level are entirely explained by changes in income growth and the distribution of income. Under this framework, development strategies should address both economic growth and income inequality. Economists at international organizations such as World Bank apply poverty-growth-inequality triangle when designing poverty reduction policies and strategies that combine measures to promote growth with actions to lower inequality.

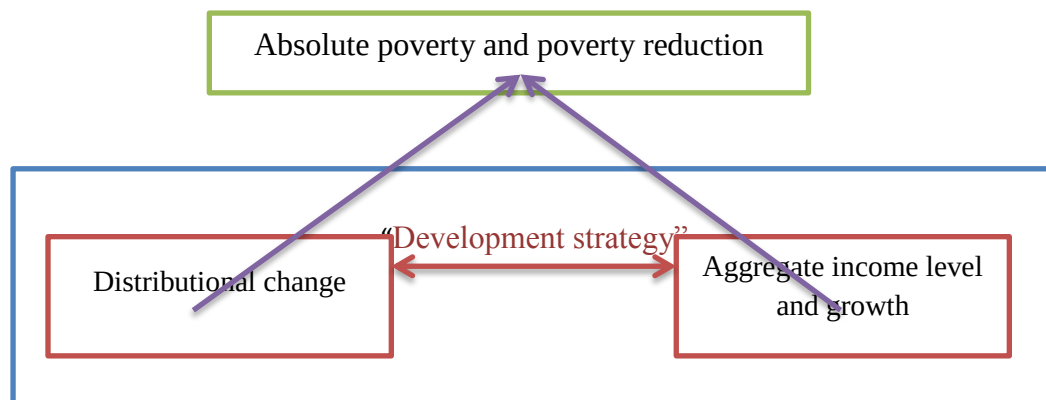


Figure 2:-The Poverty-Growth- Inequality Triangle Model

The poverty-Growth-Inequality Triangle is often illustrated as a triangle with arrows extending from each corner. The peak represents “absolute poverty,” which means the share of the population living below a defined poverty line. The lower-left denotes “inequality or distribution,” that is, how income spread across the population. The lower-right corner stands for “growth,” the change in average income. The arrows from each corner indicate causal links: inequality and growth influence each other, and both impact absolute poverty (Bourguignon, 2004).

In general, the model implies that meaningful poverty reduction requires coordinated national policies that both promote growth and reduce inequality. Changes in inequality influence absolute poverty in two ways. First, shifts in relative income distribution immediately adjust the

number of people below the poverty line. Second, changes in distribution modify the growth elasticity of poverty-how responsive poverty is to economic growth.

4.2. Review of Theories

The Solow-Swan Growth Model

The Solow-Swan model is a core neoclassical framework for analyzing long-run economic growth. It highlights capital accumulation, labor (or population), and technological change as the main drivers of growth. While increase in capital and labor raise output, diminishing returns to capital mean that continual technological progress is necessary to sustain long-term growth. So, while its primary focus is aggregate growth; the model indirectly informs the study of poverty and inequality. Their linkage can be articulated in the aspects that the Solow-Swan model forecasts that poorer economies should grow faster than the richer ones if they share similar structural parameters (saving rate, depreciation, population growth and technology). This suggests that under identical conditions, low-income countries can catch up to higher income countries. Faster growth in poorer regions theoretically translates into higher income at the lower end of the distribution, potentially reducing absolute poverty if growth is broadly shared (conditional convergence). Poverty can be analyzed in this context primarily through its effect on capital accumulation. Poor countries have the potential for faster growth (conditional convergence), but only if they accumulate capital effectively. Poor populations often have very low savings, reducing the fraction of output reinvested into capital. In the Solow model, this translates into slower capital accumulation and thus slower economic growth toward the steady state. On the other hand, in modern extensions (example Solow with human capital), income inequality can affect growth by limiting broad access to education and technology. A less equitable distribution affects effective labor productivity, shifting the production function downward and lowering steady-state-capital output (Robert Solow and Trevor Swan, 1956).

Poverty traps and human capital theories

Poverty traps are self-reinforcing mechanisms that perpetuate poverty, significantly impacted by factors like limited human capital, which hinders individuals' ability to escape impoverished conditions. These conditions may include a lack of financial resources, low level of education, inadequate healthcare, and limited access to opportunities. So, when individuals are trapped in these conditions, it becomes exceedingly difficult to invest in their own development or that of their families, creating a vicious circle of poverty that can persist across generations. On the other hand, poverty traps often interlink with various forms of capital, including financial, physical, and institutional. Individuals trapped in poverty often lack access to credit or investment opportunities that limit their ability to improve their circumstances through entrepreneurial ventures or education. Isolation from networks that can provide external support can restrict access to information, resources, and other opportunities necessary for overcoming poverty. In general, poverty traps pose significant challenges to economic growth, especially in developing countries. Therefore, focusing on the interplay between poverty traps and human capital is crucial for understanding the dynamics of poverty in developing countries. Investment in education and healthcare are essential for fostering human capital, which in turn facilitates economic growth and helps to break the cycle of poverty (Kraay & McKenzie 2014).

Human capital theory, on the other hand, says that poverty and inequality constrain the formation of human capital, difference in wealth, education access, and skill accumulation perpetuate long-term income disparities and slow aggregate productivity growth. This theory posits that the quality of education and skill acquired by individuals contribute to economic growth by enhancing productivity and innovation. Economic growth on the other hand, is measured by GDP growth. This indicate that investment in human capital such as education and healthcare, can lead to long-term economic growth by creating a skilled workforce that can adapt to technological advancements and contribute to economic activities well. Hence, this theory provides a framework for understanding how investment in human capital can lead to economic growth (Ceroni, 2001)

Social exclusion and Capital theory

Social exclusion and capital theory are interconnected concepts that address the interplay between economic and social factors in society. Social exclusion refers to the processes and conditions that prevent individuals or groups from participating fully in society, while capital theory focuses on the value and benefits derived from investment in human, social and economic resources. Theories of social exclusion often highlight the role of social capital in mitigating the negative impacts of exclusion, such as poverty and inequality. This implies that social exclusion, often associated with poverty and inequality, can hinder economic growth by limiting access to resources, opportunities and networks. On the other hand capital theory, which includes various forms of capital such as financial, physical, human, public infrastructure, and social capital, plays a crucial role in fostering economic growth by enhancing productivity and innovation. The interplay between social exclusion and capital theory is evident in the way these concepts influence economic policies and development strategies. While social exclusion can be seen as barriers to economic growth, capital theory provides a framework for understanding how investment in human and social capital can lead to sustainable economic development. Therefore, the integration of social exclusion and capital theory into economic growth framework is essential for creating inclusive and sustainable economic system that benefits all individuals and communities (Piachaud, 2002).

Cerra et al. (2021) review theoretical and empirical studies on how poverty, inequality, and economic growth interact. They find that poverty hinders growth by reducing the poor's capacity and incentive to build physical and human capital and other assets. Poverty also limits market and public service access and undermines incentives for entrepreneurship and proactive behavior, producing stagnation at both individual and societal levels. By contrast, the effect of inequality on growth is more ambiguous. While some arguments suggest that inequality may encourage effort and investment, other theoretical viewpoints and empirical studies indicate that inequality negatively affects growth through various channels, including increased distributional pressure, reduced institutional quality, heightened social conflict, and increased fertility rates. Income inequality is an escalating concern in many countries worldwide. The disparity between the wealthy and the poor has expanded across both developed and developing nations in recent decades, with little indication of reversal. Beyond ethical considerations, inequality carries

significant consequences for economic growth and development. The link between income inequality and growth is complex and multi-dimensional. In some cases, inequality can even spur growth by motivating people to work harder and invest more in education and skills. Income inequality can have a positive effect on economic growth by incentivizing individuals to work harder invest more in their education and skills. Income inequality have not only positive, but also negative on economic growth by reducing social cohesion, increasing crime rates and limiting access to education and opportunities for the less well-off (Nusair, 2025).

4.3. Empirical Review of Literature

Chowdhury and Hossain (2019) investigated the links among poverty, inequality, and economic growth using household income and expenditure surveys have tried to see the relationship among poverty, inequality and economic growth by using household income and expenditure surveys from 2010 to 2016. They report that roughly 25% of Bangladesh's population lived below the poverty line, with about 12.3% in extreme poverty. The authors argue that slow and unequal growth in household consumption has weakened the pace of poverty reduction: average annual consumption growth declined from 1.8% to 1.4% 2010 to 2016, and poorer households experienced slower consumption growth than wealthier ones.

Kesti (2020) conduct a research on "The effect of income inequality and poverty on economic growth" in developing countries using cross-country regressions. The result of his study suggests that income inequality affect economic growth more than poverty in the short run.

Olabisi et al. (2020) examined how poverty, inequality, and economic growth interact. They found that income inequality had a positive effect on growth, but this relationship was statistically insignificant in both the short and long run. Absolute poverty, however, had a significant negative impact on growth in the short run, while its long-run negative effect was not statistically significant. Population growth was positively and significantly associated with economic growth in both periods.

Topuz (2022) investigated whether income inequality affects economic growth via theoretically proposed transmission channels. Using data from 143 countries spanning 1980 to 2017, he considered both growth-enhancing and growth-inhibiting pathways. His results indicates that, overall, inequality hampers economic growth, but this effect is not uniform across countries when differences in income levels are taken into account. He also finds that higher inequality is frequently associated with higher fertility rates and lower innovations levels. .

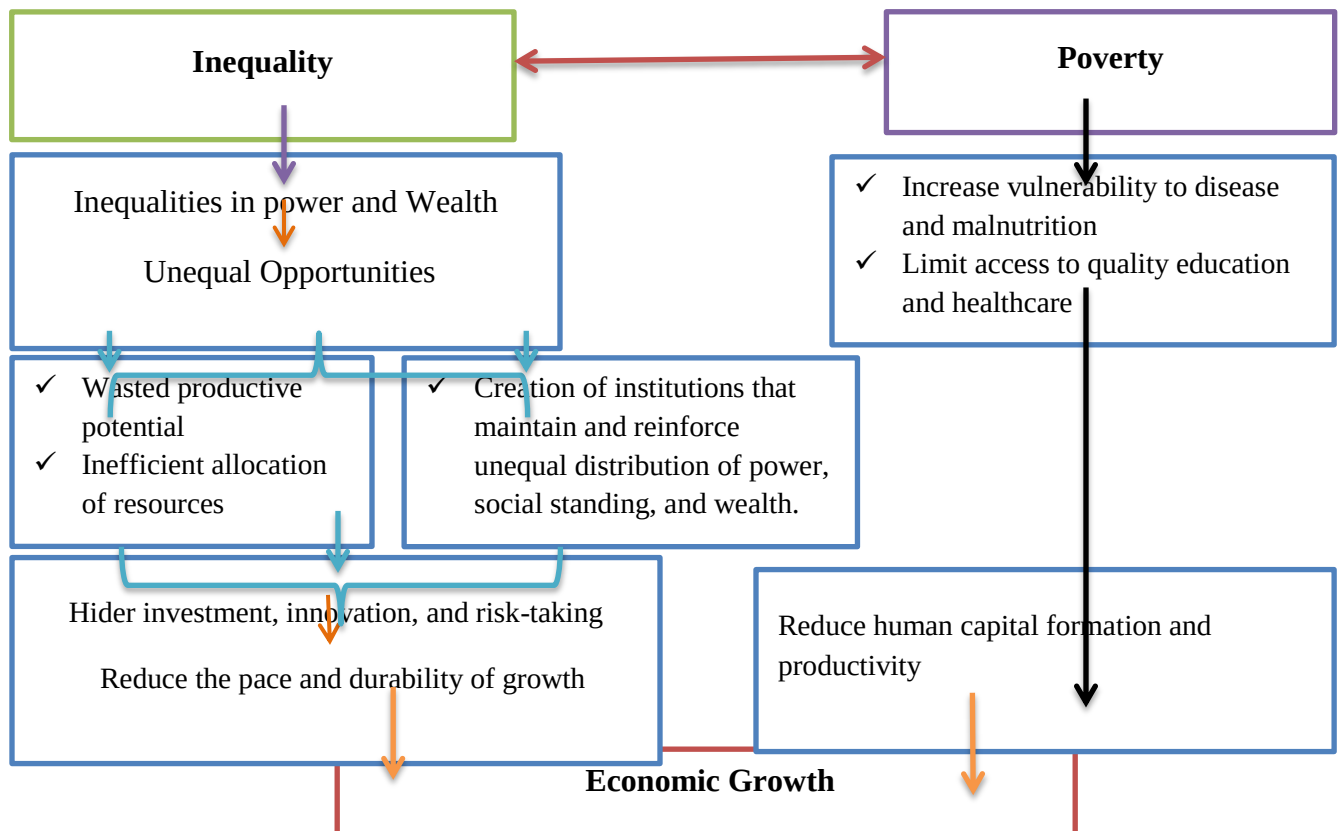
4.4. Research gap

Economic growth is widely considered essential for improving societal welfare, generating employment opportunities, and enhancing living standards. However, the distribution of resources within a society critically influences the extent to which growth translates into broad based prosperity. Despite sustained growth in many developing countries, persistent poverty and rising inequality suggests that economic gains often accumulate disproportionately to specific sections of the population, leaving large groups marginalized. The interplay between poverty,

inequality and economic growth in East Africa is significant gaps in literature. Many studies affirm negative impact high poverty levels on economic growth; highlight the indirect effects of inequality through its influence on poverty, existing evidence remains inconclusive, particularly regarding the mechanisms and contextual factors, such as governance, cultural context, political stability and economic structures, modulating these effects. **So, a key research gap** is that there is insufficient research on regional variation within East Africa countries (i.e. contextual gap). The study also tries to investigate the non-linear growth-poverty-inequality interaction using cross-country panel data set.

4.5 Conceptual Framework

The central aim of this research is to determine the extent and mechanisms by which poverty and inequality affect economic growth; considering the direct and indirect on human capital formation, capital accumulation, social cohesion and institutional functioning with a focus on policy interventions that promote inclusive and sustainable growth.



Source: Own construction from different theories and literatures

Figure 3: Conceptual framework

5. Research Design and Methodology

5.1. Description of study area

The study focused on East Africa which is vibrant region encompassing diverse countries, with unique geographical, cultural, and economic characteristics. The total population of East Africa is approximately 270 million, characterized by youthful demographics and rapid urbanization. Each country has unique ethnic composition, contributing to diverse cultural practice and social structures. This region is rich in natural resources; it faces significant challenges related to poverty and inequality. Economic growth rates have been variable, impacted by factors such as political stability, governance, and external economic conditions. The region experiences high levels of poverty, with significant disparities in wealth and access to resources.

5.2. Study Design and Approach

A strong study approach for studying how poverty and inequality affect economic growth in East Africa would be a quantitative panel-data analysis covering **six countries** in the region, guided by a deductive research strategy. Using econometric techniques, the study would assess how poverty and inequality measures relate to GDP per capita growth, while controlling other factors like population growth, investment rates, and government policy. The research would rely on credible datasets from source like the World Bank (2025), Our World in data (2025), CIA World Factbook (2024) and IMF (2025). It would start with descriptive statistics to identify overall patterns, and then use correlation and regression analyses to determine the nature the nature of these relationships. Overall, this design links theory to real-world policy concerns and can provide insights into whether poverty and inequality reduction supports more inclusive and sustainable economic growth in East Africa.

5.3. Types and Sources of data

This study applies a quantitative panel-data approach to examine how poverty and inequality influence economic growth over time. The main dataset includes GDP per capita across countries and years, with poverty measured as the share of population below the poverty line and inequality captured using each country's Gini index. Supporting variables and data are drawn from credible secondary data. The analysis covers all East African countries in the sample over period 2015-2024, and **six countries** are intentionally selected based on the theoretical expectation that poverty persistence and inequality are major constraints on economic growth. Secondary data are collected through a defined inclusion and exclusion process, and the study documents each step of data retrieval and preparation, including any transformations used to improve clarity. Finally, data quality is assessed through checks for completeness, accuracy, and consistency.

5.4. Methods of data analysis

To achieve the study's objectives, the data gathered from secondary sources were examined using descriptive statistics and econometric techniques.

5.5. Model specification

Under model specification, I identified the structure of statistical models, including which variables to be included and how the related to each other, to accurately represent the phenomenon under study.

Basic model:

$$GDP_{it} = \alpha + \beta_1 GDPPC_{it} + \beta_2 PBPL_{it} + \beta_3 GINI_{it} + \gamma x_{it} + \mu_i + \epsilon_{it}$$

Where:

- GDP_{it} : Gross Domestic Product at time t
- $GDPPC_{it}$: Gross Domestic Product per capita within country i at time t
- $PBPL_{it}$: population below poverty line within country i at time t
- $GINI_{it}$: Gini index within country i at time t
- x_{it} –vector of control variables (such as Gross capital formation, population growth rate, and government expenditure)
- γ : Coefficient of vector that captures the effect of the control variables on the dependent variable.
- μ_i : entity fixed effects (captures time-invariant unobserved heterogeneity)
- time fixed effects (captures common shocks)
- ϵ_{it} : error term
- α : Constant term
- $\beta_1, \beta_2, \beta_3, \beta_4$: are coefficients explanatory variables

Fixed Effects Model (FE):

This model controls for time-invariant characteristics of the entities, isolating the impact of time-varying predictors. It is useful when we suspect unobserved heterogeneity that correlates with the independent variables.

$$\Delta GDP_{it} = \alpha + \beta_1 \Delta GDPPC_{it} + \beta_2 \Delta PBPL_{it} + \beta_3 \Delta GINI_{it} + \gamma \Delta x_{it} + \epsilon_{it}$$

Random Effects Model (RE):

Random effects model is statistical approach designed to analyze data that involves multiple observations over time for the same entities (such as countries). It is useful when unobserved effects are not correlated with independent variables.

$$GDP_{it} = \alpha + \beta_1 GDPPC_{it} + \beta_2 PBPL_{it} + \beta_3 GINI_{it} + \gamma x_{it} + u_{it}$$

Where:

- u_{it} : time fixed effects (captures common shocks) $= (\alpha_i + \epsilon_{it})$

5.6. Diagnostic tests

Multicollinearity, serial correlation, heteroskedasticity, and normality of residuals are critical diagnostic checks in panel data analysis because they directly affect the reliability of regression results. **Multicollinearity** undermines the precision of coefficient estimates by inflating standard errors, making it difficult to isolate the independent effect of poverty and inequality on growth. **Serial correlation** violates the assumption of independent errors across time, leading to biased standard errors and misleading significance tests in dynamic economic relationships. **Heteroskedasticity** occurs when error variances differ across countries or time, distorting inference and reducing efficiency of estimators. Finally,

normality of residuals ensures that hypothesis testing and confidence intervals are valid, especially in small samples. Together, these diagnostics safeguard against spurious findings and strengthen the credibility of policy-relevant conclusions in East African growth studies.

Table1: Expected sign of variables

Name of variables			
Independent variables	sign	Control variables	sign
Poverty	-	Investment rate (gross capital formation)	+
Inequality	+/-	Population growth rate	-
		Government expenditure	+/-

- **Poverty: Negative** → High poverty reduces both the ability and incentives of individuals to invest in human capital, entrepreneurship or risk-taking.
- **Inequality: Ambiguous, conditional** → (i) Inequality can exacerbate social instability, reduce broad access to credit and human capital, and depress aggregate demand, thus lowering growth.
(ii) Moderate inequality can incentivize innovation, entrepreneurship, and savings in richer segments, potentially boosting growth.
- **Population growth rate: Negative** → In Solow- style models, higher population growth reduces capital accumulation, leading to lower per capita and output growth.
- **Investment rate (Gross capital formation): Positive** → Higher investment increases the capital stock, productivity, and output growth.
- **Government expenditure: Ambiguous, depending on composition and efficiency**
 - (i) Public investment in infrastructure, education, and healthcare can enhance productivity and long-term growth.
 - (ii) Excessive or inefficient government spending, particularly on transfers or consumption, may crowd out private investment and reduce incentives, potentially lowering growth.

6. Results and Discussions

6.1. Descriptive analysis

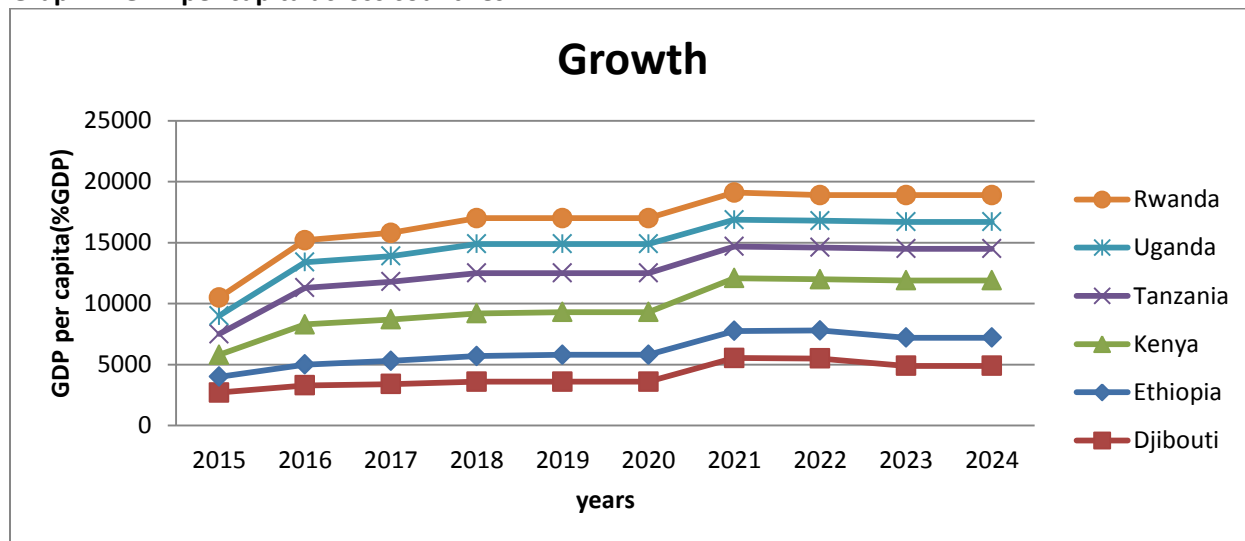
6.1.1. Trend analysis

Growth

Gross domestic product (GDP) is the most widely used indicator of a country's economic output and general well-being. It measures the scale of production, which influences payments to factors like capital and labor. Hence, GDP growth provides an estimate of how a country's total income enlarges over time. Aggregate income the supplies resources that can raise household and individual earnings. For this reason, economists focus on clarifying what drives growth and on policies to increase it. Yet whether growth alone is enough to enhance every person's welfare depends on how its benefits are allocated. If benefits are shared proportionally across all individuals, analyzing growth using "representative agent" serves to understand the economic dynamics and policy

implications. But when growth disproportionately benefits some groups assessing individual well-being requires examining overall growth together with the distribution of income.

Graph 1: GDP per capita across countries



Source: own computation (2025)

From the above graph, we can see that all countries experienced growth in GDP per capita from 2015 to 2023, although the rate and consistency of growth varied significantly across countries. Starting from \$1,300 in 2015, the Ethiopia's GDP per capita rose progressively to \$2,300 by 2023, indicating that continuous economic growth, but at slower pace. Djibouti shows the highest GDP per capita among the five, starting at \$2,700 in 2015 and peaking at \$5.535 in 2023. However, it experienced a decline to \$4,900 by 2023, indicating possible economic challenges and some adjustments. Kenya's GDP per capita grew from \$1,800 in 2015 to its peak of \$4,700 by 2023, showcasing a strong upward trend. Tanzania's GDP per capita has been relatively stable, starting \$1,700 in 2015 and remaining around \$2,600 since 2020, showing less growth compared to others. Uganda's GDP per capita on the other hand, increased from \$1,500 in 2015 to \$2,200 by 2022, but it has maximum attainment since then, indicating potential stagnation. Finally, Rwanda's GDP per capita increases gradually from about 1500 in 2015 to around 2100 by 2018, after which changes are modest and it remains near 2100-2200 through 2024.

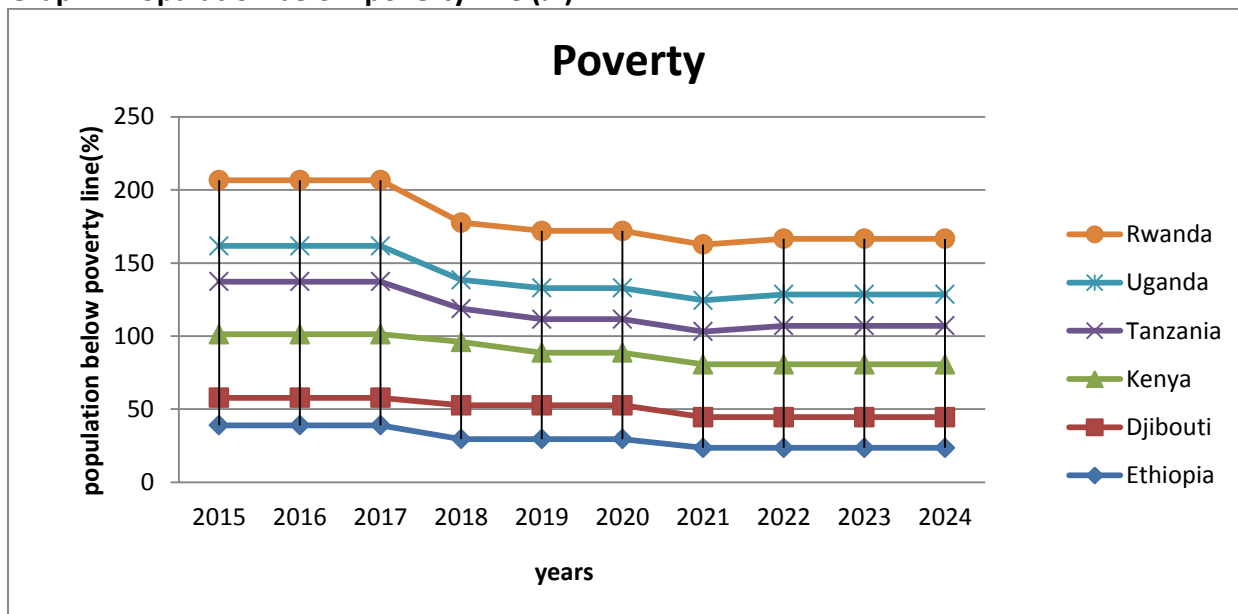
Poverty

Poverty is a state in which people or communities do not have sufficient access to the basic resources needed for survival and a decent standard of living (items like adequate food, safe shelter, education, and healthcare). It is commonly described in two ways:

- **Absolute poverty:** A situation where individuals lack the minimum requirements for survival. This form is measured against a fixed threshold, such as World Bank's international poverty line (commonly cited as living on less than \$1.90 per day).

- Relative poverty: A measure of how a person's economic position compares with others in the same society, typically assessed by how their income stacks up against the community's average income.

Graph2: Population below poverty line (%)



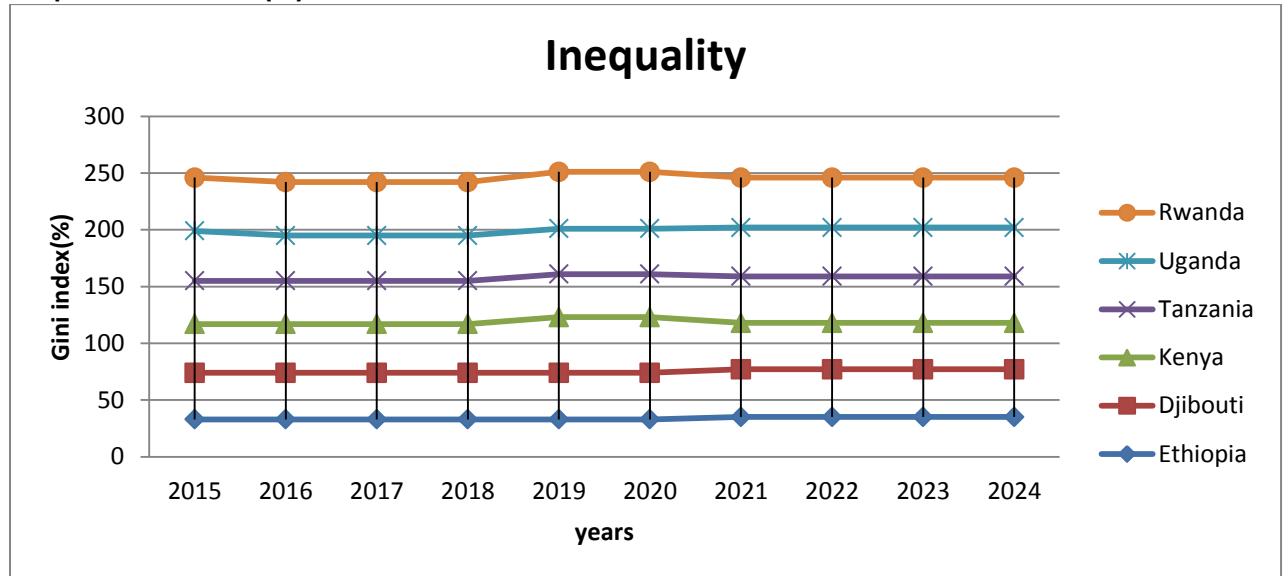
Source: own computation (2025)

The graph 2 above illustrate that in Ethiopia there was a significant reduction in the percentage of the population living below the poverty line, dropping from 39% in 2015 to 23.5% in 2023, which indicate a positive trend in poverty reduction over the years. Poverty rate remained relatively stable in Djibouti around 18.8% from 2015 to 2016, with a slight increase to 23% in 2018. After that the rate fluctuated slightly but held fairly stable around 21.1% in 2021-2024. In case of Kenya poverty rate appears constant at 43.4% between 2015 and 2017, then show a decline to 36.1% in 2018, which has continued through 2024. This suggests some progress in poverty alleviation efforts. The poverty rate was consistently around 36% from 2015 to 2017, in Tanzania. A significant improvement occurred in 2018 as it dropped to 22.8%, but by 2022 and 2023, it began to rise again to 26.4%, indicating some hindrance (setback) in poverty management. Uganda saw a gradual decline in poverty rates from 24.5% in 2015 to 21.4% in 2024, indicating a consistent although slow, and trend toward poverty reduction. Finally, Rwanda shows highest poverty rate in 2015 with modest improvement to 38.1% by 2021, but then stagnates at that level.

Income inequality

Inequality describes the unequal allocation of wealth, resources, and opportunities across individuals or groups. The Gini index quantifies this dispersion in income or wealth within a population and is widely used to indicate economic inequality. Its value ranges from 0 to 1: 0 denotes complete equality, while 1 represents complete inequality.

Graph 3: Gini index (%)



Source: own computation (2025)

From the above graph 3, we can observe that the Gini index remained stable at 33% from 2015 to 2019, indicating low income inequality in Ethiopia. In 2021, it slightly increased to 35%, suggesting a minor rise in inequality, but still reflects relatively low inequality overall. Djibouti maintained a Gini index of 41% from 2015 to 2018, reflecting moderate income inequality. In 2021, it increased to 42%, indicating a slight rise in inequality. Kenya shows consistently high levels inequality, with a Gini index of 43% from 2015 to 2018. A notable rise occurred in 2019 and 2020 to 49%, highlighting a significant increase in income inequality. This figure decreased to 41% in 2021, suggesting some improvement, though inequality levels remain high. Tanzania kept a Gini index of 38% from 2015 to 2020, indicating moderate inequality. This figure rose to 41% from 2021 to 2024, showing a slight rise in income inequality. Uganda had the highest Gini index at 44% in 2015, reflecting considerable income inequality. Finally, Rwanda records the highest inequality overall, starting at 47, peaking 50 in 2019, and then settling at 44 from 2020 onward. In summary, Ethiopia shows the most stable and equitable trend, Kenya and Rwanda display sharp fluctuations, and Uganda and Tanzania highlight the challenge of sustaining improvements in inequality.

4.1.2. Summary of descriptive statistics

Table2: Descriptive statistics

Variable	Mean	Median	Standard Deviation	Minimum	Maximum
GDP per capita (USD)	2,950	2,400	1,050	1,300	5,535
Population below poverty line (%)	29.7	23.5	8.9	18.8	44.9
Gini index (%)	41.0	41	4.3	33	50
Population growth rate (%)	2.5	2.5	0.4	1.7	3.3
Gross capital formation (%)	12.6	8.4	70.3	-640.0	182.3
Government expenditure (Billion USD)	9.4	8.8	6.4	0.53	24.27

The descriptive statistics of the panel data shows that East African economies vary widely in income, poverty, and inequality. The average GDP per capita is about 2,950, with a median 2,400, indicating moderate income levels and large disparities between countries such as Djibouti and Ethiopia. Poverty averages around 30%, but the high standard deviation (8.9) tells irregular progress. The Gini index averages 41%, suggesting that reasonable inequality overall, though Rwanda and Kenya infrequently reach extreme value near 50. Population growth rate is relatively stable at rough 2.5%, with Uganda consistently higher. Gross capital formation is highly volatile, indicating both strong investment flows and deep reductions, especially in Djibouti. Government expenditure plays a crucial role in shaping economic and social outcomes across East Africa. Kenya leads with the highest spending reflecting its large public sector and infrastructure investments, while Ethiopia's steady increase aligns with its success in reducing poverty and maintaining low inequality. Djibouti extreme fluctuations suggest unstable fiscal management, possibly tied to external financing. Tanzania and Uganda maintain moderate, stable expenditure levels, supporting gradual development, and Rwanda's disciplined but low spending mirrors its controlled fiscal approach despite persistent inequality. Overall, the region shows that higher and consistent government spending tends to correlate with poverty reduction, though not always with lower inequality. In general the data illustrate a region experiencing economic growth but with persistent inequality and rough investment stability.

Fig4: Relationships between indicators.

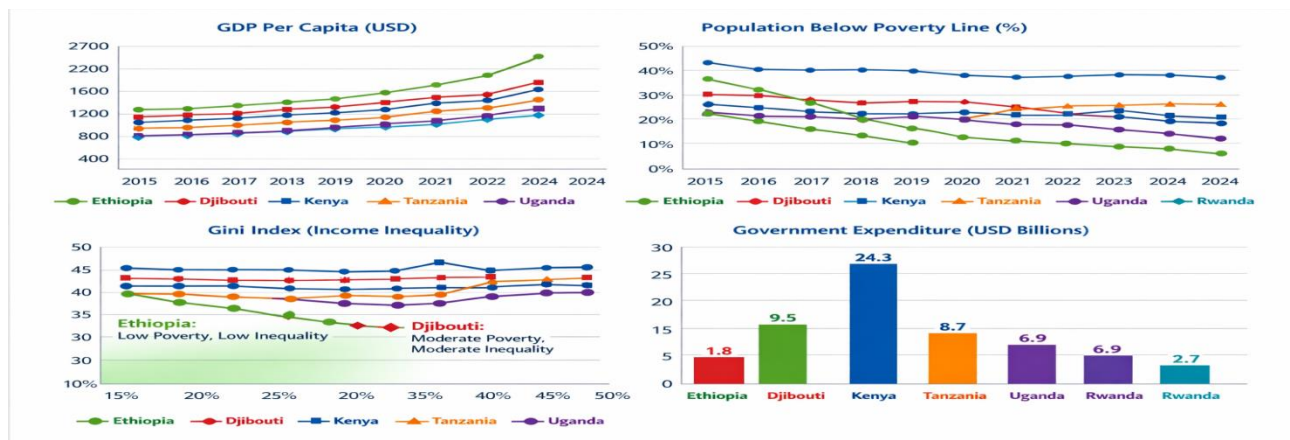


Table3: Pearson correlation matrix

Variable	GDPPC	PBPL	GINI	PGR	GCF	Gov. Expenditure
GDPPC	1.00	-0.72	0.41	-0.65	-0.08	0.89
PBPL	-0.72	1.00	0.36	0.52	0.11	-0.61
GINI	0.41	0.36	1.00	-0.12	0.05	0.33
PGR	-0.65	0.52	-0.12	1.00	-0.09	-0.54
GCF	-0.08	0.11	0.05	-0.09	1.00	-0.02
Gov. Expenditure	0.89	-0.61	0.33	-0.54	-0.02	1.00

- ✓ GDP per capita is strongly correlated with government expenditure (0.89), meaning richer countries tend to spend more.
- ✓ Poverty rate is negatively correlated with GDO per capita (-0.72) and government expenditure (-0.61), showing that higher income and spending reduce poverty.
- ✓ Population growth is negatively linked to GDP per capita (-0.65) and government expenditure (-0.54), suggesting that faster-population growth are associated with lower income and fiscal capacity.
- ✓ Income inequality shows moderate positive correlation with GDP per capita (0.41), indicating that growth does not always reduce inequality.
- ✓ Gross capital formation is largely uncorrelated with other variables, reflecting its volatility (especially in Djibouti).
- ✓

6.2 Econometric Analysis

Econometric analysis is used to apply statistical methods to the collected data over time for the same entities to test theories, to apply appropriate models, and to make prediction. Therefore, techniques such as regression analysis and hypothesis testing were undertaken.

Test for heteroskedasticity

Breusch-Pagan/Cook-Weisberg test for heteroskedasticity
Assumption: Normal error terms
Variable: Fitted values of lnGDPPC

H0: Constant variance

chi2(1) = 1.33
Prob > chi2 = 0.2491

Since P-value = 0.2491 > 0.05, it indicates that the absence of heteroskedasticity

Test for multicollinearity

. estat vif

Variable	VIF	1/VIF
lnPBPL	1.51	0.660997
lnGINI	1.41	0.711223
GEXRinBill~r	1.39	0.718349
PGR	1.37	0.729185
GCF	1.15	0.869079
Mean VIF	1.37	

To assess multicollinearity among the independent variables, Variance Inflation Factors (VIFs) were calculated. The result shows that all VIF are well below the commonly accepted threshold of 5, indicating multicollinearity is not a problem in this model. The tolerance values (1/VIF) ranged between 0.5 to 0.87, further confirming that the predictors are sufficiently independent.

Test for Normality

. predict resid, resid
. swilk resid

Shapiro-Wilk W test for normal data					
Variable	Obs	W	V	z	Prob>z
resid	60	0.97251	1.494	0.866	0.19338

The shows that $p = 0.193 > 0.05$, you **fail to reject H0** → residuals are approximately normal. The Shapiro–Wilk test indicated that the residuals were approximately normally distributed ($W = 0.973$, $p = 0.193$), supporting the validity of the regression assumptions.

Ramsey RESET test

. estat ovtest

Ramsey RESET test for omitted variables

Omitted: Powers of fitted values of lnGDPPC

H0: Model has no omitted variables

F(3, 51) = 2.54

Prob > F = 0.0669

The Ramsey RESET test output shows that the null hypothesis that the regression model has no omitted variables and is correctly specified was tested by adding powers of the fitted values of lnGDPPC. The tested statistics $F(3,51) = 2.54$ with p-value of 0.069 which is greater than 0.05. this indicates that we do not reject the null hypothesis → the model is correctly specified (no omitted variables, functional form is adequate).

Fixed-effect (FE)

In FE model, the individual –specific effect is removed through transformation of the corresponding model. One drawback of the FE estimator is its inability to estimate the coefficient for time-invariant regressors (since they are also eliminated during transformation)

Table4: Regression output for fixed effect without robust

lnGDPPC	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
lnPBPL	-.4239069	.1699207	-2.49	0.016	-.7653754	-.0824385
lnGINI	-.8060402	.4603745	-1.75	0.086	-1.731197	.119117
PGR	-.0695053	.0944964	-0.74	0.466	-.2594028	.1203923
GCF	.0005892	.0002187	2.69	0.010	.0001496	.0010288
GEXR	.0496735	.010918	4.55	0.000	.0277329	.0716141
Constant	12.06738	1.928344	6.26	0.000	8.192226	15.94253
F test that all $u_i=0$: F(5, 49) = 17.90				Prob > F = 0.0000		

The F-test comparing pooled OLS and FE is shown at the bottom of the above output. The significant F-statistics (17.90) tell us the FE model is preferred to pooled OLS.

Random-effect (RE)

Table5: Regression output for random effect without robust

lnGDPPC	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
lnPBPL	-.8384081	.1286051	-6.52	0.000	-1.090469	-.5863468
lnGINI	.6410409	.3307629	1.94	0.053	-.0072424	1.289324
PGR	-.421892	.0707762	-5.96	0.000	-.5606108	-.2831732
GCF	.000275	.000339	0.81	0.417	-.0003893	.0009394
GEXR	.02089	.0054024	3.87	0.000	.0103015	.0314784
Constant	9.205929	1.294117	7.11	0.000	6.669507	11.74235

Choice between FE and RE models

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) Std. err.
	(b) FE	(B) RE		
lnPBPL	-.4239069	-.8384081	.4145011	.239833
lnGINI	-.8060402	.6410409	-1.447081	.6589633
PGR	-.0695053	-.421892	.3523868	.1337722
GCF	.0005892	.000275	.0003142	.0000886
GEXRinBill~r	.0496735	.02089	.0287835	.0166304

b = Consistent under H0 and Ha; obtained from `xtreg`.
B = Inconsistent under Ha, efficient under H0; obtained from `xtreg`.

Test of H0: Difference in coefficients not systematic

$\chi^2(4) = (b-B)'[(V_b-V_B)^{-1}](b-B)$
= 29.83
Prob > χ^2 = 0.0000

The essential distinction in panel data analysis is that between FE and RE models. The result of the Hausman test comparing these is shown above. Since p-value = 0.0001 < 0.05, we reject the null hypothesis (RE is appropriate), and we conclude that FE model is appropriate.

Table6: Regression output for fixed effect with robust

lnGDPPC	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
lnPBPL	-.4239069	.1023388	-4.14	0.009	-.6869771	6.698977
lnGINI	-.8060402	.4934477	-1.63	0.163	-2.074488	.4624075
PGR	-.0695053	.0240239	-2.89	0.034	-.1312607	-.0077498
GCF	.0005892	.0000475	12.40	0.000	.0004671	.0007113
GEXR	.0496735	.0048721	10.20	0.000	.0371493	.0621977
Constant	12.06738	2.088399	5.78	0.002	6.698977	17.43578

This fixed-effect (within) regression output shows how poverty, inequality, population growth, capital formation, and government expenditure affect GDP per capita across six East African countries over time. The within $R^2 = 0.54$ (**Annex1**) indicates that the model explains about 54% of the variation in GDP per capita within countries, while very low between and overall R^2 values suggest limited explanatory power across countries. Looking at coefficients: poverty (lnPBPL) has a significant negative effect (-0.42, $p = 0.009$), meaning higher poverty reduce GDP per capita; inequality (lnGINI) is negative but not statistically significant ($P = 0.163$); population growth (PGR) is significantly negative (-0.07, $p = 0.034$), implying faster population growth rate reduce per capita income; gross capital formation (GCF) has very strong positive effect (0.00059, $p < 0.001$), and government expenditure (GEXR) is also strongly positive (0.05, $p < 0.001$), both indicating investment and fiscal spending boost growth. Overall, the model suggests poverty and population growth hinder economic growth, while capital formation and government spending are key driver of per-capita income.

7. Conclusions and Recommendations

In conclusion, the dynamics of poverty and inequality significantly slow the progress of economic growth, creating barriers that hinder the potential for sustainable development. As resources and opportunities become increasingly concentrated among the wealthy, the marginalized majority is left with limited possibilities for advancement, perpetuating a cycle of disadvantage. This disparity not only discourages individual potential but also weakens social cohesion and economic stability. For effective growth, it is crucial to implement policies that promote inclusive economic growth, enhance access to quality education and eliminate systemic barriers faced by low-income groups.

Addressing the dual challenges of poverty and inequality requires multidimensional policies that combine inclusive economic growth, poverty reduction strategies and policies, human capital development and institutional structural reforms. Depending on current situation and evidence and global best practice, the following recommendations are particularly effective:

- ✓ Expand formal employment opportunities in sectors manufacturing, services and modern agricultural practice to promote inclusive economic growth.
- ✓ Provide subsidized quality education, particularly for those of low-income and remote area populations, so that access to education and skill development is expanded for all.
- ✓ Invest in public health infrastructures to strengthen health service systems.
- ✓ Implement Fiscal policies concepts that reduce inequality through progressive taxation and fair distribution of public resources

It is important to acknowledge the study's certain **limitations**. The sample of countries and the period covered are relatively small, and the research did not consider other factors that might affect how poverty and inequality influences economic growth, such as institutions, and the stability of the political environment.

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