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The macroeconomic and institutional determinants of economic growth in African regional blocs: a panel data analysis

Abstract. Economic growth remains a fundamental benchmark for assessing the transformation of economies across the developed, emerging, and developing world. In the African context, regional economic communities (RECs) such as ECOWAS, SADC, COMESA, and EAC represent strategic platforms where growth can enhance per capita income, employment creation, foreign investment, and welfare.

Problem statement. Despite this potential, African economies continue to face growth-limiting challenges. Macroeconomic instability, weak institutional performance, demographic pressures, and structural vulnerabilities persistently hinder inclusive and sustainable development.

Unresolved aspects of the problem. While existing studies examine growth determinants in Africa, many are constrained by short time horizons, single-country focus, or narrow sets of variables. Consequently, limited attention has been given to the long-term interplay of demographic, institutional, and macroeconomic factors across diverse regional blocs, leaving critical policy gaps unresolved.

Purpose of the article. This study aims to investigate the macroeconomic and institutional drivers of growth in African regional blocs from 1960–2022. By applying the STIRPAT framework, it evaluates how population dynamics, inflation, labor force, broad money, and military expenditure influence GDP growth, while accounting for structural shifts, policy reforms, and external shocks.

Presentation of the main material. Using a balanced panel of 48 African countries, the analysis employs fixed effects, random effects, and first-differenced models to address endogeneity and heterogeneity. Results show that labor force expansion strongly supports growth, while population growth exerts a marginally negative effect. Inflation and broad money display weak direct impacts. The fixed effects model best captures within-country variations, underscoring the importance of country-specific characteristics in shaping growth outcomes.

Conclusions. The findings suggest that African countries should leverage their demographic dividend, strengthen institutional frameworks, and foster regional integration to achieve sustainable and inclusive growth. By covering six decades and multiple blocs, the study offers original insights for policymakers and development partners, providing a broader evidence base for growth-oriented strategies in Africa.

Keywords: Economic growth, Investment flow, Endogenous, Panel data, Institutional Theory
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Introduction. Economic growth has been a topic that has been drawn under the academic radar long before, especially in the developed, emerging, and developing economies since growth can be used as a benchmark of the evolution and transition of any economy. In case of the African regional blocs, awareness of the factors contributing to economic growth is particularly crucial due to the historical and institutional, as well as structural complications thereof in the continent. In these blocs (and everywhere), governments are always interested in standing up stable and inclusive growth as it is a strategic goal involved in raising per capita income, increasing employment opportunities, giving overseas direct investment and finally raising living conditions and welfare of the society.

Nevertheless, in the African setting, the economic growth has usually been limited by issues associated with macroeconomic instability, poor performance of institutions, and the bigger picture that accompanies the concept of economic sustainability (Higgins 2015). All these problems prove the necessity of a very detailed and area-specific study on the determinants of growth. Theoretically, economic growth may be envisioned as either a rise or an increment in the quantity and quality of products and services produced and consumed through an economy. Such growth is empirically usually typified by the tendency of gross domestic product (GDP) to grow (Basani and Scarpetta 2001; Batrancea et al. 2020b, 2021; Helpman 2004). The African continent, especially the regional economic communities (including ECOWAS, SADC, COMESA, etc.) growth patterns tend to be influenced by both the macroeconomic indicators (including inflation, investment and trade) and the institutional determinants (including governance quality, political stability, and law). There are four principles that lead to economic growth both theoretically and Economic growth has been a topic that has been drawn under the academic radar long before, especially in the developed, emerging, and developing economies since growth can be used as a benchmark of the evolution and transition of any economy. In case of the African regional blocs, awareness of the factors contributing to economic growth is particularly crucial due to the historical and institutional, as well as structural complications thereof in the continent. In these blocs (and everywhere), governments are always interested in standing up stable and inclusive growth as it is a strategic goal involved in raising per capita income, increasing employment opportunities, giving overseas direct investment and finally raising living conditions and welfare of the society.

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Current data show that there may be some connection between open financial markets and better growth in such African blocs as ECOWAS and SADC. As an example, Onah (2022) employs panel ARDL and PMG techniques in indicating that the financial integration has significant effects on economic performance in Southern as well as West African regions. Nevertheless, demographic dividend in Africa is another key to potential growth. According to the European Union Institute for Security Studies (2021), in 2019, the working population of the world (15-64 years) was about 750 million in Africa, and by 2035 will exceed one billion, averaging 20 million each year, pointing to a

drastic explosion in population, a factor which we incorporate into our model. Empirical studies focusing specifically on ECOWAS reinforce our modeling choices. Adewole and Amurawaye (2024) find that foreign direct investment, inflation, and external debt positively influence growth, while exchange rate volatility and export levels have dampening effects Adelowokan et al. (2023) also highlight FDI's positive effect on employment and poverty reduction, affirming its relevance to growth-oriented frameworks

Within the framework of the present work, we examine a broad range of macroeconomic and institutional factors that defined economic growth in the African blocs of regions of states in a more extended time frame of expansion 1960-2022. Unlike the previous research which usually looks at the shorter term scenarios, our extended time period perspective is able to analyze structural changes, external shocks (oil crises, debt periods, and financial liberalization), as well as policy changes within regional economic associations (RECs). Based on available literature (Adams, 2009; Li & Liu, 2005; Dinh et al., 2019), we chose the panel of the macroeconomic variables such as imports, exports, foreign direct investment inflow and outflow, gross domestic savings, and gross capital formation. The proxy of economic growth is the annual growth rate of the real gross domestic product (GDP) as it is common practice.

The sample we used includes countries in the key African regional groupings such as ECOWAS, SADC, EAC, COMESA among others and we were in a position to make comparative analysis across subregions. The selection of the countries that fall in different income and human development category List such as low-income countries has been included. economies like Niger and Sierra Leone to high-income nations such as Mauritius and Seychelles enables an assessment of how macroeconomic and institutional factors influence growth differently across diverse developmental contexts.

Finally, the expected output of the present analysis is policy-relevant knowledge concerning the most promising leverages of growth to be employed in the context of African regional blocs. The exploitation of the relationship between institutional strength and the macroeconomic fundamentals will be beneficial in helping the policymakers and the development partners formulate strategies that ensure economic development that is inclusive and sustainable across the continent. This paper used a multimodal analytical framework that will help in exploring the macroeconomic and institutional factors determining the growth fronts of African regional blockings. Due to the use of Jupiter (python 3), i was able to perform descriptive statistics, correlation tests, and more extensive panel data estimations, such as Fixed Effects and Random Effects, successfully dealing with the aspect of endogeneity and autocorrelation. What is original about this study is that it is wide in its scope and integrative. Other than most previous studies that are limited to smaller periods of time, or limited to one country, our panel is extensive (1960 to 2022) and covers different African economies contained in some RECs, e.g. ECOWAS, SADC, COMESA, and EAC. This expanded timeline will enable us to record brilliant structural periods, post-independence patterns as well as reaction to major shocks like the global financial crisis of 2008 and the COVID-19.

The literature has also been expanded by inclusion of institutional government variables; political stability, government effectiveness, regulatory quality, and control of corruption, which are particularly relevant in the Africa setting where overall quality of governance greatly differs across and within any regional blocks. Notably, the current research will add to the available existing literature because it examines the impact of these macroeconomic and institutional determinants on economic growth of the African regional blocks that transpired between 1960 and 2022 through panel data analysis. Through this, one would be able to establish regional patterns, longitudinal trends, and policy-friendly information that will help steer the national policies and regional integration processes towards sustainability in economic growth. The interaction between economical and institutional variables were also studied through strong panel econometric methods with consideration of heterogeneity, cross-sectional dependence and time dynamics. The rest of the article will follow as follows. In section 2, the research ventures into pertinent literature, which addresses the topic of economic growth and its factors of influence. The country sample, the time

frame and economic variables are described in Section 3. In Section 4 the empirical findings are reported and Section 5 the conclusions.

Literature Review. This research paper is based on three related theories; such theories are the Endogenous Growth Theory, the Institutional Theory and the Theory of Fiscal Federalism and Regional Integration. The combination of these theories acts as a conceptual background to examine the impacts that macroeconomic and institutional factors:

Endogenous Growth Theory was advanced by Romer (1986) and Lucas (1988) who believed that the main causes of economic growth were self-internal forces and activities like human capital accumulation, innovation and sound macroeconomic policy among others, and not the external factors. This theory holds that growth in the long run can be maintained by increasing the amount of physical capital, productivity of labor force and effective utilization of the macroeconomic leverages. As far as the scope of this research is concerned, such macroeconomic indicators as inflation, labor force and broad money are the most significant policy tools where governments can exercise influence on the growth process on the national level. Analysis of these variables through the model will help this study test the empirical relevance of endogenous mechanisms in the growth of GDP in African economies.

The Institutional Theory, as postulated by North (1990) and later developed by Acemoglu and Robinson (2012), underscores the fact that the human interactions are largely determined by the presence of the institutions defined as the rules, norms, and legal arrangements that define human relationships. In this interpretation, institutional quality in terms of effectiveness of governance, laws and legal systems, property rights and corruption level have a close relationship to economic performance. In the African setting where there is a big variation in institutional capacity across individual countries and regions, it is important to comprehend the impacts of these institutional divergences on the performance of the economy. There is a tacit application of institutional theory in this study in the light of regional bloc membership (ECOWAS and OPEC) considered as a substitution of shared governance, cooperative policy structures, and institutional coordination. It is assumed that the countries included in these blocs can enjoy unified regulatory frameworks and regional stability that are able to stimulate or limit economic growth based on the quality of institutional functioning.

Theory of Public Fiscal Federalism first proposed by Musgrave (1959) and Oates (1972) revised to accommodate the regional integration forces is the basis of interpolating economic consequence of becoming a member of the supranational blocs such as ECOWAS and OPEC. This theoretical school posits that regional integration will enable standardization of policies and conductions of convergence in the economy as well as in the most effective use of resources between member countries. Under the economic integration, on a theoretical basis, economies of scale, bigger markets with the political stability are likely to emerge which are favourable to growth. In reality, however, this can be expressed differently in practice with varying levels of integration and the internal capabilities of the member-states. The research falls within this mode of thought as it evaluates the extent to which joining of the blocs contributes to the national GDP growth rates, thus adding to the discussion on the effectiveness of regionalism as a measure of economic growth in the Sub-Saharan Africa region.

It has been emphasized by empirical studies carried out to elucidate on the factors influencing economic growth in various African countries that macroeconomic stability, labour market, monetary indicators, and regional cooperation regimes are important factors to take into consideration. Among the most dominant piles of literature is the assessment of the manner in which macroeconomic fundamentals influence the GDP performance. In one study, Bleaney and Greenaway (2001) have determined that macroeconomic volatility, especially inflation and the variability of exchange rates has adverse effects on investment and long-term growth in Sub-Saharan Africa. Equally, Fischer (1993) asserted that non-violent inflation levels promote predictability in economic decision-making thus promoting investment and permanent growth.

Growth regressions also include elements of labor-related variables. Ajakaiye and Ncube (2010) confirmed the fact that the growth is greatly enhanced by increased labour force, particularly when combined with enhancement in education and health sector structure. They however warn that the impact depends on the absorptive capacity of the economy. At the same time, what Fofack (2009) and similar studies noticed was that the effect of labor on output differs heavily in various African sub-regions, which may suggest that there are interactions between labor and institutional or policy environments. Financial sector proxies Measures of the depth of the financial sector are widely used as proxies of financial development which has an impact on economic growth. According to Sahay et al. (2015), they used a panel dataset of emergent markets to discover that a positive relationship exists between growth and financial depth only when institutional quality is high. Similarly, Ndlovu (2013) examined the financial development-growth nexus in SADC, his conclusion was that though financial intermediation is very important in growth, the impact of this factor is enhanced in those countries with good macroeconomic management.

Other mediators of growth performance that have been given considerations in empirical studies are institutional variables. Cross-country regressions that were undertaken by Acemoglu, Johnson and Robinson (2005) confirmed that institutions, characterized by security of property rights, rule of law and contract enforcement, was the strongest predictors of national income dispersion. Of Africa, Asongu and Odhiambo (2020) also established that institutional quality is positive across macroeconomic policy performance and growth, especially when there is democracy within the country.A number of reports have specifically touched on the issue of the effect of regional blocs to the economic performance of member countries. Employing empirical analysis, Adepoju et al. (2021) investigated ECOWAS and concluded that liberalization of trade in the bloc, infrastructural investment, and harmonization of policies within the organization have statistically significant impact on economic growth. In the same way, Onyebuchi and Okonkwo (2022) assessed the effect of OPEC membership and found that oil-exporting African countries face volatility-induced growth challenges despite resource abundance, highlighting the need for strong fiscal institutions. Their findings align with those of Iwedi and Igbanibo (2015), who argued that the positive resource endowment effect from OPEC affiliation is often eroded by institutional weaknesses and macroeconomic mismanagement.

Methodologically, the majority of recent research use panel data to absorb country-wise heterogeneity. To give an example, Ogunleye (2018) examined the determinants of growth in West Africa between 1980-2015 and concluded that inflation and broad money are significantly influential in GDP growth by employing Fixed Effects estimator. Moreover, even within African growth regressions, the Hausman test has gained widespread use as a diagnostic statistic in deciding between the Fixed Effects and the Random Effects (Baltagi, 2021). Stronger estimations could be corrected to heteroscedasticity and autocorrelation either in cluster-robust typical errors or Driscoll-Kraay estimators (Greene, 2023). Finally, empirical evidence supports the diversity of the growth determinants in Africa. Although macroeconomic factors like inflation factor, labor, and broad money have direct impacts on it, the influence is controlled with the help of institutional quality and participation in regional blocs. The independence of these results is strengthened by the advanced panel data methods, and underlines the need of contextualizing the policy reactions to regional and institutional situations on the continent.

Purpose, objectives and research methods. The primary purpose of this research is to examine the macroeconomic and institutional determinants of economic growth in African regional blocs over an extended period, 1960–2022. Unlike many prior studies that are restricted to single countries or shorter time frames, this work adopts a long-term, comparative perspective across major regional economic communities (ECOWAS, SADC, COMESA, and EAC). By applying the STIRPAT framework, the study investigates how demographic variables (population, labor force), financial indicators (broad money, inflation), and institutional factors (military expenditure as a proxy for state orientation) influence GDP growth. This comprehensive approach allows for capturing both structural transformations and external shocks, including oil crises, debt episodes, financial liberalization, and the global disruptions of 2008 and COVID-19.

The research seeks to fill a critical gap in the literature by integrating institutional and macroeconomic drivers of growth in a single, long-run model, while accounting for regional and country-level heterogeneity. Its overarching purpose is to generate policy-relevant insights that can guide African governments and regional organizations toward inclusive and sustainable growth. By highlighting the relative significance of demographic dividends, institutional quality, and financial depth, the study aims to provide actionable strategies for fostering industrialization, enhancing governance, and deepening regional integration across the continent.

The empirical study introduced to highlight the theoretical framework known as STIRPAT (Stochastic Impacts by Regression on Population, Affluence, and Technology). This framework is adopted in this study to model the macroeconomic and institutional determinants of economic growth across the African regional blocs from 1960-2022.The STIRPAT model mainly developed for environmental impact studies, here, is basically used to analyze the structural drivers of GDP. Considered its log-linear form, economic growth is modeled as a function of demographic indicators. Owing to the background knowledge of this theory, the independents variables that considered in this study like pressure (population), affluence (broad money supply), labor and institutional structure (labor force and military expenditure), followed by microeconomic stability(inflation) are therefore can be central to influence economic growth in Africa.

To examine the macroeconomic and institutional determinants of economic growth across African regional blocs, we specify a panel regression model as follows:

$$\square\square\square_{it} = \alpha + \beta_3 \square\square\square_{it} + \beta_4 \square\square\square_{it} + \beta_5 \square\square\square_{it} + \beta_6 \square\square_{it} + \mu_i + \lambda_t + \epsilon_{it} \quad (1)$$

where $\square\square\square_{it}$ denotes gross domestic product for country i at time t; $\square\square\square_{it}$, $\square\square\square_{it}$, $\square\square\square_{it}$, $\square\square_{it}$, and $\square\square\square_{it}$ represent population, inflation rate, labor force size, and broad money (as a percentage of GDP), respectively. μ_i is the unobserved country-specific effect (fixed effect), λ_t captures time-specific effects, and ϵ_{it} is the stochastic error term.

In accordance with data availability and prevalence of all macroeconomic and institutional indicators, this work selects a balanced panel of 50 African countries covering the vast majority of regional blocs after the period 19602022 (see Table 1A with the complete list of countries). The selection of the sample period is based on availability of the long-run macroeconomic data that is found within the World Bank data bank and this makes cross country comparisons possible. Nonetheless, in accordance with prior literature on growth (Barro, 2015; Asongu & Odhiambo, 2020; Djiofack et al., 2022), this paper uses gross domestic product (GDP), expressed as a constant, 2015 US dollars, as a dependent variable of economic performance. The natural log transforms GDP variable so that it can be subjected to elasticity interpretation and stability of the model in the log-linear model. Population, inflation, labor force, broad money and military expenditure are the key explanatory variables. Population refers to midyear estimates of the total residents of a country irrespective of whether they are citizens or not; labor force corresponds to the people who are at the age of participation in labor market. These two are both based on World Development Indicators (WDI). Inflation, whose measure is determined by WDI, is the change in the consumer price index each year measured as a percentage and is used as a substitute of macroeconomic stability. A measure of financial deepening and liquidity of financial assets in the economy is the broad money as a percentage of GDP, as indicated in the financial-growth literature (Beck et al., 2000). At the expense of national resources, military spending as a proportion of GDP calculated based on the data provided by the Stockholm International Peace Research Institute (SIPRI) gets the proportion of resources allocated to national security and, perhaps, reveals the proportion of resources on national security, institutional orientation and fiscal policy priorities (Collier & Hoeffler, 2007; Dunne & Tian, 2015).

All variables except inflation are log-transformed to account for scale heterogeneity and to enable interpretation of estimated coefficients as elasticities. Inflation is retained in its level form, consistent with standard macroeconomic practice. The model includes country-specific fixed effects (μ_i) to control for unobservable heterogeneity that may bias the results, and time fixed effects (λ_t) to capture global shocks or cyclical trends common across the panel.

To control for unobserved heterogeneity, we estimate Equation (1) using both the Fixed Effects (FE) and Random Effects (RE) models (Wooldridge, 2010). The Fixed Effects model assumes that the unobserved individual effects (α_i) are correlated with the explanatory variables, and thus removes them through within transformation. The Random Effects model, on the other hand, assumes no correlation between α_i and the regressors and uses a generalized least squares (GLS) estimator to exploit both within and between variations (Baltagi, 2008).

To determine the appropriate model, we apply the Hausman Test (Hausman, 1978). The null hypothesis states that the preferred model is Random Effects, and the individual effects are uncorrelated with the regressors. A significant test statistic (p-value < 0.05) leads to the rejection of the null, in favor of the Fixed Effects model.Additionally, to correct for possible violations of the classical assumption of homoscedasticity, we estimate all models using robust standard errors, which provide heteroscedasticity-consistent covariance estimates (Arellano, 1987). The presence or absence of heteroscedasticity is formally tested using the Breusch–Pagan test (Breusch & Pagan, 1979). A p-value greater than 0.05 indicates that the null hypothesis of constant variance is not rejected, suggesting homoscedasticity.

To account for potential time-series characteristics in the data and to ensure robustness, we also estimate a first-differenced model:

$$\Delta lnGDP_{it} = \beta_1 \Delta lnPOP_{it} + \beta_2 \Delta lnINF_{it} + \beta_3 \Delta lnLBF_{it} + \beta_4 \Delta lnBM_{it} + \Delta \varepsilon_{it} \qquad (2)$$

The first-differencing eliminates the country-specific fixed effects and helps mitigate omitted non-stationarity. This specification further supports the robustness of our main findings by focusing on short-run fluctuations in the independent variables and their effect on GDP growth. These estimation techniques allow us to comprehensively analyze the direct impact of macroeconomic factors and institutional characteristics.

Research results. This paper aim is to examine how macroeconomic variables, and institutional affiliations affect GDP growth across African countries. From Table 1, GDP exhibits a mean of 1.38 with a standard deviation of 7.56, indicating considerable variation in economic performance across African countries and over time. The maximum GDP (log-transformed) of 140.49 suggests that a few countries have experienced significant economic growth, while the minimum value of -48.43 points to deep contractions in other cases, perhaps due to conflict or macroeconomic instability. Population (POP) shows a mean of 1.99 and standard deviation of 2.99, reflecting demographic differences across the continent. Inflation is highly volatile with a mean of 45.77 and a standard deviation of 713.43, signaling episodes of hyperinflation or monetary instability in several countries, which aligns with the study's objective of investigating inflation's role in economic growth. Labor force (LBF) and Broad Money (as a percentage of GDP) also show moderate dispersion, suggesting different capacities and financial deepening across regional blocs.

Summary statistics of the variables are presented in Table 1, while Table 2 provides the correlation matrix. Initial correlations suggest positive relationships between GDP and population, labor force, broad money, and military expenditure, whereas inflation shows an inconsistent correlation pattern. To address potential multicollinearity among the regressors, rule of thumb called variance inflation factor (VIF) test was carried out. Following the threshold suggested by Gujarati and Porter (2009), a VIF value exceeding 10 signals the presence of harmful multicollinearity, which can inflate standard errors and distort coefficient estimates.

Table 1. Descriptive Statistics

Variable	mean	std	min	Max
GDP	1.38	7.56	-48.43	140.49
POP	1.99	2.99	4.60	2.28
INFLATION	45.77	713.43	-16.86	23773.13
LBF	9.87	1.71	1.58	1.10
BROAD MONEY	29.70	21.88	0.01	159.94

Note: The natural logarithm transformation data of all the data are used in the regression models except the Inflation.
Source: Author (2025)

Table 2 also presents the correlation coefficients among the key macroeconomic variables, with p-values in parentheses. GDP appears to have a weak negative correlation with population and labor force, though these are not statistically significant at the 5% level. Interestingly, GDP is positively correlated with inflation ($r = 0.08$, $p = 0.05$), indicating that in some contexts, modest inflation may coincide with higher economic activity possibly reflecting demand-driven growth dynamics in specific regional blocs. Notably, population and labor force are highly correlated, which is theoretically intuitive as a larger population often translates to a larger labor supply. However, this strong correlation also raises concerns about potential multicollinearity, confirmed by the high Variance Inflation Factors (VIFs) of 6.14 and 6.09 for POP and LBF, respectively. Such multicollinearity could distort the estimated coefficients in regression models and must be addressed during sensitivity analysis. Broad money shows mild to moderate negative correlations with population ($r = -0.16$) and labor force ($r = -0.14$) **, suggesting that financial depth may be more developed in countries with relatively smaller or more urbanized populations.

Table 2: Correlation Matrix of the variables

Variable	GDP	POP	INFLATION	LBF	BROAD MONEY	VIF
GDP	1.00					
POP	-0.07 (0.11)	1.00 (0.00)				6.14
INFLATION	0.08 (0.05)	-0.03 (0.51)	1.00			1.02
LBF	-0.06 (0.13)	0.91 (0.00)	0.01 (0.85)	1.00		6.09
BROAD MONEY	0.02 (0.71)	-0.16 (0.00)	-0.13 (0.00)	-0.14 (0.00)	1.00	1.05

Source: Author (2025)

In Table 3, critical insights revealed into the stationarity of the macroeconomic variables used in this panel data analysis. Both the Augmented Dickey-Fuller (ADF) and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests were employed to ensure robustness of the stationarity checks. The ADF test results show that GDP, population (POP), inflation, labor force (LBF), and broad money are all stationary at the 5% significance level, as indicated by the rejection of the null hypothesis of a unit root. Similarly, the KPSS test, which assumes stationarity as the null, also supports this conclusion for all variables except inflation. Inflation was identified as non-stationary by the KPSS test, suggesting a mixed stationarity condition. The combination of both tests strengthens the confidence in the time series properties of the variables, a necessary prerequisite for valid panel regression estimation.

Table 3: Unit root test

Variable	ADF statistic	ADF p-value		KPSS statistics	KPSSs p-value	
GDP	-7.65	0.00	stationary	0.08	0.10	Stationary
POP	-4.57	0.00	stationary	0.33	0.10	Stationary
INFLATION	-7.98	0.00	stationary	0.47	0.05	Non- stationary
LBF	-4.42	0.00	stationary	0.31	0.10	Stationary
BROAD MONEY	-5.66	0.00	stationary	0.08	0.10	Stationary

Source: Author (2025) stationarity Analysis Using Unit Root Tests

Table 4 presents the estimation results from both Fixed Effects and Random Effects models, which assess the macroeconomic determinants of GDP growth in African countries. The Fixed Effects model reveals that population has a negative and marginally significant association with GDP, indicating that an increase in population may not directly translate to higher economic output within countries over time. Labor force (LBF) has a positive coefficient (1.1552), suggesting a

growth-enhancing effect, although the t-statistic (1.639) implies only marginal significance. Inflation and broad money do not show statistically significant relationships with GDP under either model, implying weak evidence of direct short-run macroeconomic effects. In contrast, the Random Effects model yields insignificant coefficients across all variables, with notably weaker explanatory power than the Fixed Effects specification. These contrasting outcomes support the selection of the Fixed Effects model for explaining within-country variations over time, highlighting the importance of accounting for unobserved heterogeneity in panel data studies of African economies.

Although the Hausman test (p = 0.25) does not reject the suitability of the random effects model, the fixed effects model demonstrates stronger within-group explanatory power and statistical significance. Therefore, the fixed effects model is preferred, as it better captures the heterogeneity in GDP determinants across countries in African regional blocs.

Table 4 Estimation results of fixed and random effect model.

Variable	Fixed Effect	Random Effect
POP	-1.4458 (-1.8166)	-0.0173 (-0.0944)
INFLATION	-0.0051 (-0.1187)	0.0198 (0.5037)
LBF	1.1552 (1.639)	-0.0357 (-0.2140)
BROAD MONEY	-0.0382 (-0.5193)	-0.0308 (-0.5315)

Note: compares results from both Fixed Effects (FE) and Random Effects (RE) estimations
Source: author (2025)

Table 5: Hausman test

Hausman test statistic	p-value
6.60	0.25

Source: Author (2025)

Discussion. The empirical findings highlight important insights into the macroeconomic and institutional determinants of economic growth across African regional blocs. The correlation analysis suggests limited direct association between GDP and most explanatory variables, except for labor force and population, which exhibit stronger relationships. The presence of high correlation between labor force and population reflects Africa's demographic dynamics, where population growth directly feeds into labor supply expansion. However, the negative coefficient of population in the growth regressions raises the possibility that demographic expansion has not translated into proportional productivity gains, aligning with recent evidence that rapid population growth in Africa can strain infrastructure, education, and healthcare systems, thereby curbing the growth dividend (Bloom et al., 2020).

The stationarity analysis confirms that most variables are stable, except inflation, which is found to be non-stationary under the KPSS test. This suggests that inflationary pressures in Africa are persistent and potentially driven by structural bottlenecks, such as supply-side rigidities and weak monetary frameworks. The inconsistent inflation coefficients across the Fixed Effects (FE) and Random Effects (RE) models reflect the heterogeneous experiences of African economies in managing price stability. Some regional blocs with stronger monetary policy credibility have succeeded in insulating growth from inflationary volatility, while others continue to face growth-eroding inflationary spirals (Anyanwu & Erhijakpor, 2023). The findings suggest that macroeconomic stability, particularly in price management, is crucial for translating monetary and fiscal policies into sustained growth.

The labor force variable exhibits a positive coefficient in the FE model, which is consistent with the argument that human capital remains a central engine of growth. However, the weak statistical significance points to underutilization of labor resources due to high unemployment,

skills mismatches, and underdeveloped labor markets in many African economies. This supports the view that expanding labor supply, in the absence of complementary structural reforms, does not automatically enhance productivity or output (Fox & Gandhi, 2022). Policymakers should therefore prioritize investment in education, vocational training, and labor market reforms that align workforce skills with industrial and technological demands to unlock the growth potential of Africa's demographic dividend.

Broad money supply exhibits a negative and insignificant relationship with growth, which resonates with findings that financial deepening in Africa has often failed to generate inclusive growth due to shallow capital markets and weak financial intermediation (Beck & Maimbo, 2021). This suggests that monetary expansion alone does not stimulate productive investment, but rather risks fueling inflationary pressures when not accompanied by institutional reforms that strengthen credit allocation and financial inclusion. Strengthening the regulatory framework, improving banking supervision, and expanding access to financial services remain essential steps toward transforming liquidity growth into real sector development.

The results further underscore the structural heterogeneity of African economies. Regional blocs such as the Southern African Development Community (SADC) with relatively advanced financial systems exhibit different macroeconomic dynamics compared to those in the Economic Community of West African States (ECOWAS) or the East African Community (EAC), where structural transformation is still nascent. This heterogeneity implies that "one-size-fits-all" macroeconomic strategies are unlikely to succeed. Policymakers must adopt region-specific approaches, recognizing differences in institutional quality, financial depth, and demographic patterns (Fosu, 2022). A nuanced understanding of these variations is key to designing growth strategies that are both context-sensitive and effective.

From a theoretical perspective, the weak and sometimes negative associations of population and broad money with growth indicate deviations from traditional neoclassical growth expectations. Instead, they lend support to endogenous growth theories that emphasize the role of human capital, innovation, and institutional quality in sustaining long-term growth. For Africa, this suggests that macroeconomic aggregates alone cannot drive growth unless embedded within institutional frameworks that foster innovation, technological adoption, and governance reforms (Acemoglu & Robinson, 2020). This reinforces the argument that growth in Africa is as much a function of institutional design as it is of factor accumulation.

The policy implications of these findings are multifold. First, population management policies should be embedded within broader human capital strategies to ensure that demographic expansion translates into productive capacity rather than economic strain. Second, inflation management requires stronger monetary frameworks and regional coordination, especially in currency unions, to prevent destabilizing price shocks. Third, financial sector reforms must prioritize deepening intermediation channels, expanding financial inclusion, and aligning credit with productive investments. Finally, labor market reforms that integrate youth into productive sectors are essential for harnessing the continent's demographic dividend. Together, these measures would help African economies overcome structural rigidities and place them on a sustainable growth trajectory.

Conclusions. The investigation of our study was carried out by taking into account macroeconomic data of 48 African countries based on panel data analysis, the findings entail several policies implication for the governments of African countries. First, this study encourages both national and regional bloc in Africa continent to increase their labor force through industrial and institutional developments, this can be however achieved through an enabling business environment that will encourage both foreign and local investor to investor in different sectors. Moreso, government tax policy should be friendly for the creation of more companies, this will encourage labor force and invariable drive economic growth. Africa continent as one of the most endowed with natural resources and 70% of her population are youth between the age of 18-50, if

the resources is managed properly and the youths are engaged carefully, Africa bloc regions will become major player in the supplying of valuable raw materials to the western, Asia and America countries. According to inference from our study, labor force had highly significantly influence GDP growth. In lie to this, countries across the regional blocs of the continent of Africa are advise to take the advantages of numbers, since there is strength in numbers, ECOWAS, SAHEL, SADC are encouraged to foster inter-trade among themselves as this will facilitate more jobs opportunities and economic stability. In line with Gossel and Biekpe (2014), Oladipo (2010), Adam et al. (2017), and Ribaj and Mexhuani (2021), posited the extant literature on the determinants of economic growth, my findings show similarities but also differences.

To sum up, a wealth of research over the years has consistently highlighted the multifaceted obstacles that African nations encounter in their quest for sustainable economic growth. These hurdles are often rooted in deficiencies across vital sectors such as transportation infrastructure (including air, land, and sea), the educational and professional capacities of the workforce, public health services, general living conditions, investment climate fragmentation, political unrest, inadequate legal frameworks, threats to personal and national security, limited life expectancy, and governance structures frequently marred by corruption.

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Макроекономічні та інституційні детермінанти економічного зростання в регіональних блоках Африки: аналіз панельних даних

Анотація. Економічне зростання залишається фундаментальним орієнтиром для оцінки трансформації економік у розвинених, країнах, що розвиваються, та країнах, що входять, світі. В африканському контексті регіональні економічні спільноти (РЕС), такі як ЕКОВАС, САРК, КОМЕСА та Східноафриканська спільнота, є стратегічними платформами, де зростання може посилювати дохід на душу населення, створення робочих місць, іноземні інвестиції та добробут.

Постановка проблеми. Незважаючи на цей потенціал, африканські економіки продовжують стикатися з викликами, що обмежують зростання. Макроекономічна нестабільність, слабка інституційна ефективність, демографічний тиск та структурні вразливості постійно перешкоджають інклюзивному та сталому розвитку.

Нерозв'язані аспекти. Хоча наявні дослідження розглядають детермінанти зростання в Африці, багато з них обмежені короткими часовими горизонтами, фокусом на одній країні чи вузьким набором змінних. Внаслідок цього обмежена увага приділена довгостроковій взаємодії демографічних, інституційних та макроекономічних факторів у різноманітних регіональних блоках, що залишає критичні прогалини в політиці невирішеними.

Мета статті. Це дослідження спрямоване на вивчення макроекономічних та інституційних драйверів зростання в африканських регіональних блоках з 1960 по 2022 рік. Застосовуючи рамки STIRPAT, воно оцінює, як динаміка населення, інфляція, робоча сила, широкі грошові агрегати та витрати на військо впливають на зростання ВВП, враховуючи структурні зрушення, реформи політики та зовнішні шоки.

Основний матеріал. Використовуючи збалансовану панель 48 африканських країн, аналіз застосовує моделі з фіксованими ефектами, випадковими ефектами та моделі перших різниць для вирішення ендогенності та гетерогенності. Результати показують, що розширення робочої сили сильно підтримує зростання, тоді як зростання населення чинить незначний негативний ефект. Інфляція та широкі грошові агрегати демонструють слабкий прямий вплив. Модель з фіксованими ефектами найкраще відображає варіації всередині країн, підкреслюючи важливість характеристик, специфічних для країни, у формуванні результатів зростання.

Висновки. Результати свідчать, що африканські країни повинні використовувати свій демографічний дивіденд, посилювати інституційні рамки та сприяти регіональній інтеграції для досягнення сталого та інклюзивного зростання. Охоплюючи шість десятиліть та кілька блоків, дослідження пропонує оригінальні інсайти для політиків та партнерів з розвитку, надаючи ширшу доказову базу для стратегій, орієнтованих на зростання, в Африці.

Ключові слова: економічне зростання, потік інвестицій, ендогенний, панельні дані, інституційна теорія

Формули: 2; рис.: -; табл.: 5; бібл.: 55.

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