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REVISITING THE IMPACT OF MACROECONOMIC VARIABLES ON ECONOMIC GROWTH IN SUB-SAHARAN AFRICAN COUNTRIES: AN INSIGHT FROM AUGMENTED MEAN GROUP (AMG) ESTIMATOR

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ABSTRACT

The quest for economic growth and development has been the major concern of sub-Saharan African (SSA) economies over the years. This study investigates the impact of macroeconomic variables on economic growth in 7 Sub-Saharan African (Angola, Chad, Equatorial Guinea, Gabon, Libya, Nigeria and Sudan) countries from 1990 to 2023. Using the Augmented Mean Group (AMG) estimator, the results show that

Introduction

The importance of economic growth in Africa cannot be underestimated with most countries experiencing low growth rates. Discussions around this area have taken center stage in recent years among policy makers while focusing on developing countries particularly sub-Saharan African countries (SSA). Macroeconomics is the branch of economics that studies the behavior and performance of an economy as a whole. It focuses on the aggregate changes in the economy such as unemployment, growth rate, gross domestic product and inflation.

The effective and efficient coordination of the macroeconomic variables (MEVs) would determine the

inflation and unemployment rates negatively affect economic growth, while export, gross capital formation, and human capital have a positive impact. Real effective exchange rate and labor force participation rate have a negative but insignificant effect. The findings suggest that SSA countries can promote economic growth by increasing exports, investing in human capital, and implementing policies to control inflation and unemployment. The study's results have implications for policymakers seeking to foster sustainable economic growth in the region.

Keywords: Macroeconomic, Variables, Economic Growth, Augmented Mean Group, sub-Saharan Africa.

growth of the economy as it would aid the provision of social amenities. Macroeconomic indicators especially inflation, gross domestic product growth, exchange rate foreign direct investment and monetary policy rate stand central in economic governance. Policy-makers use them to assess their economies' health. Citizens evaluate politicians' performance using them as yardsticks. Furthermore, a primary priority for governments worldwide needs to be maintaining a steady pace of economic expansion (Higgins, 2015). Greater per capita income, more employment opportunities due to increased competition among economic agents, higher levels of foreign direct investment, an overall improvement in people's living standards and well-being, and other benefits are frequently the aim of developing economies.

Macroeconomic variables are used to measure the economy's current state and forecast where it is going, identifying potential risk along the way. The negligence to checkmate such variables may spell doom for the economy as they direct the economic situation. The main causes of unsustainable development include high inflation, rising foreign debts, unstable exchange rate, and policy somersault (Paul & Akindele, 2016). Macroeconomic variables are indicators or main signposts signaling the current trends in the economy. Keynes identified some main macroeconomic variables that relate to the economy as a whole as gross domestic product, exchange rate, interest rate, Inflation, balance of payment, capital formation and money supply (Glahe, 2005).

One of the major goals of macroeconomic which can be either objective or policy variables always aimed at achieving sustainable economic growth. In developed

countries, the relationship between macroeconomic variables and economic growth tends to be relatively stable and predictable (World Bank, 2020). However, this relationship is not stable and predictable in Africa countries because these macroeconomic problems are caused by poor implementation of productive measures and macroeconomic policies across countries in the continent. The effect of macroeconomic indicators on economic growth is still an unresolved issue theoretically as well as empirically. Although the theoretical positions on the subject are quite diverse, the conventional wisdom is that volatility of macroeconomic indicators is a source of economic instability or stagnation.

Empirical research, however, does not conclusively support the conventional wisdom. A few studies report positive and significant relation between macroeconomic variables and economic growth while several others find significantly negative or no relation between these indicators and growth in real output (Ubaka, 2016; Mustapha et al, 2017). In summary, these results suggest that the use of different methods, models, time frames and variables could affect the causality results and that causality results are varied across countries and even within each individual/group country.

The limited existing literature on determinants of economic growth in Africa have not provided a strong basis to tackle the continuous macroeconomic problems in the continent. It is against this backdrop that this study seeks to contribute to existing panel empirical evidence in Africa using augmented Mean Group. This study sought to examine the effect of macroeconomics indicators of selected Sub Sahara African Countries (Angola, Chad, Equatorial Guinea, Gabon, Libya, Nigeria and Sudan). The main motive of selecting the above countries lies on the fact they are major exporter of crude oil in this region hence, making their economy a resemblance of one another.

Statement of the Problem

Over time, the impact of a few key macroeconomic variables has remained woefully inadequate to support the rising demands for social, political, and public spending necessary to support economic growth. Gross domestic output level of a country is influenced by all microeconomic and macroeconomic variables which are all generally interlinked to measure a country's economic growth; this research will analyze the variables that have been identified by previous literature to have had a significant impact on the GDP across 10 SSA countries. There exists a cumbersome and still growing yet fragmented body of literature which has tried to investigate the effect of inflation, exchange rate, export, and unemployment rate on economic growth.

As early mentioned, in developed countries, the relationship between macroeconomic variables and economic growth tends to be relatively stable and predictable (World Bank, 2020). In the case of Sub-Saharan African economies, the relationship between macroeconomic variables and economic growth can be even more complex and precarious. Many Sub-Saharan African countries face structural issues such as political instability, weak institutions, and inadequate infrastructure, which exacerbate the effects of macroeconomic variables. Inflation can be particularly damaging in SSA economies where it may lead to severe economic distortions and reduce real income. Interest rates may be high due to perceived risks and inflationary pressures, making borrowing costly and hindering investment. Exchange rate volatility can be pronounced, especially in countries that rely heavily on a few export commodities or face frequent balance of payments crises (Jabaru & Jimoh, 2021).

Government and policy makers across the continent have embarked on various macroeconomic policies to address these issues like inflation, exchange rate crisis, interest rate, unemployment rate problem facing region economy. Some of the policies involved the use of monetary and fiscal policy, export promotion strategy, exchange rate policy imports substitution strategy and many others. The fundamental objectives of the policies include price stability, full employment, stable exchange rate and improved capital formation and sustainable economic growth. These policies have achieved varying degrees of success. However, challenges remain, including persistent inflation, exchange rate instability, and an over-reliance on oil revenues. Moreover, structural issues such as corruption, inadequate infrastructure, and low human capital development continue to constrain the effectiveness of these policies. High inflation, unemployment, exchange and interest rates have hindered the growth of SSA economies over time. Therefore, this study attempts to explore the impact of selected macroeconomic variables on economic growth in SSA countries.

Objective of the Study

The main objective of this study is to investigate the impact of inflation, exchange rate, interest rate, export, Foreign Direct Investment and unemployment rate on economic growth of selected SSA countries.

Literature Review

Conceptual Reviews

Macroeconomic Variables: Macroeconomic variables refer to factors that are pertinent to the broad economy at the regional or national level and affect a large

number or population rather than a few individuals. Macroeconomic variables are indicators or main signposts that signal trends in the economy.

Gross Domestic Product: This is the total monetary or market value of all finished goods produced within a country's borders in a specific time period. Gross Domestic Product (GDP) is the broadest quantitative measure of a nation's total activity. It represents the monetary value of all goods and services produced within a nations' geographic borders over a period of time especially one year (Aroriode & Ogunbadejo, 2014).

Exchange Rates: The value at which one country's currency is exchanged with another country's currency is known as the exchange rate. It also means the value of nation's exchange in terms of other nation's exchange. It includes two components, the domestic currency & the foreign currency.

Inflation: Inflation is the amount that the cost of goods and services within an economy has increased over a given time period (usually measured over a year). In most nations, this is measured using the Consumer Price Index (CPI). According to Jhingan (2015), "inflation is the steady and noticeable rise in the general level of prices". In general, inflation has produced a serious issue due to its economic impact when the value of the country's currency continues to decline while its exchange rate with the rest of the world rises.

Unemployment: It refers to a state where a large number of able-bodied persons of working age who are willing to work but cannot find work at the current wage levels (Dauda, 2017). Unemployment rate is the percentage of total workforce who are unemployed and are looking for a paid job. Unemployment rate is one of the most closely watched statistics because a rising rate is seen as a sign of weakening economy.

Export: Export can be defined as surplus goods and services of a country that are sent to other countries in the world for sale. Increased export positively impacts on aggregate output by relaxing foreign exchange constraint. In a similar vein, export expansion leads to growth through the stimulation of technical change and investment or by demand spill over into other sectors of the economy, export expansion can also accelerate the growth process by providing foreign exchange, which is required to produce capital goods and other intermediate goods that are needed to keep industries running (Sajo & Li, 2017).

Theoretical Literature

Endogenous Growth Theory

The study will be anchored on Endogenous growth theory which is also called new growth theory or neoclassical augmented growth theory developed by Mankiw, Romer & Weil (1992). Endogenous growth theory posits that growth is mainly the outcomes of endogenous rather than the exogenous or uncontrollable external factors. The theory believed that high growth rate can be achieved through human capital investment, knowledge and innovation.

Moreover, technological progress is endogenous because it depends on investment in research and development of the country. The theory envisages increasing technological return to scale which result to long term knowledge-based growth. Furthermore, increase in production can encourage investment in human capital and faster innovation. Thus, private sector and government institutions are encouraged to nurture initiative and innovation for businesses and individual to be proactive through funding of research and development and other related activities.

The theory provides a basis for emerging economies to achieve high growth rate through training, education, and technological progress. They also identified the significance of globalization in augmenting activities (like on-the-job training and education) and provide regulatory institution for sustainability in the country, this account for its continuous relevance.

Empirical Literature

The contribution of macroeconomic variables and economic growth has been tested by different economists using different econometric procedures:

Günay and Yenilmez (2024) analyzed how macroeconomic indicators that may affect economic growth in 34 sub-Saharan African countries using GMM panel data analysis spinning the period1990 to 2019. The estimation results revealed FDI in lower-middle-income sub-Saharan African countries was statistically significant and inversely related to economic growth; it was observed that the coverage ratio of exports to imports has a statistically significant and linear relationship. The results further show a statistically significant correlation between the labour force participation rate and total natural resource and economic development in the upper-middle income category of nations analyzed. As a result, the influence of factors varied and fluctuated on economic growth based on the income levels of different groups.

Iballi, Smajli & Ziberi (2022) analyses the impact of some key macroeconomic on economic growth of a developing country, the Republic of Kosovo. This study uses

secondary data from The World Bank Indicators for the time period 2010–2020. Ordinary least squares (OLS) econometric model is employed, the dependent variable used is the gross domestic product (GDP) growth, and the independent variables used are private consumption, remittances, export, and employment. The study revealed that consumption, employment, exports, and remittances have a positive impact on Kosovo's economic growth measured by GDP.

Oyebowale & Algarhi (2020) investigate the impact of macroeconomic determinants on economic growth among twenty-one (21) African economies. The study employs Pooled Mean Group (PMG) estimator on the panel data. The pooled long-run coefficients indicate that growth rates in exports, government expenditure and gross capital formation have statistically significant positive long-run relationship on economic growth at 1%, 5% and 1% levels respectively; while broad money is not statistically significant among the countries. However, diverse short-run coefficients and error variances differ across the African countries. The results of Dumitrescu-Hurlin Granger causality test shows bidirectional causality between growth in gross capital formation and economic growth among the African countries; while growth in broad money, growth in exports and growth in government expenditure show no direction of causality with economic growth.

Ogosi et al. (2022) investigated the macroeconomic factors that influence Nigeria's economic growth from 1991 to 2019. The study utilized both Simple Linear and Multiple Regression analysis. The study also used ECM and the Johansen Cointegration Test. The findings demonstrated that while inflation had a negative impact on economic growth, unemployment and foreign direct investment had favourable effects. Jabaru & Jimoh (2021) examined the impact of some selected macroeconomic variables on economic growth in Nigeria for a period of (1980 – 2017). The study established that unemployment rate, inflation rate and crude oil exports had a negative impact on GDP while exchange rate, foreign direct investment, population growth rate and age dependency ratio had positive impact on GDP over the period reviewed.

Omar & Nor (2020) examined the link between macroeconomic variables namely population, unemployment and export with the economic growth in Malaysia. The quarterly time series data collected between 2006 and 2016 on the identified macroeconomic variables were analyzed using least square regression method. Thus, in the results, it was found that a linear relationship existed among the population, unemployment, export and economic growth. The result further revealed that

population is negative and significantly related to economic growth. Also, it was found that the impact of unemployment on economic growth was insignificant.

Biswas & Saha (2014) investigate the determinants of economic growth in India using time series analysis from 1980 to 2011. The findings revealed that gross domestic capital formation has a positive impact on GDP in the short run. Exports, money supply and foreign direct investment boost growth while inflation and fiscal deficits negatively impact. India experienced stable economic growth during the study period as a result of careful and purposeful management of macroeconomic growth determinants. Ndambiri et al. (2012) used the generalized system of moments (GMM) method to investigate the determinants of economic growth in 19 SSA countries from 1982 to 2000. Physical capital development, the export market and human capital formation substantially affect economic growth. Government spending, nominal discount rate and foreign aid negatively affect economic growth.

Methodology

Descriptions and Source of Data

The descriptions of the variables and source of data for the selected 7 sub-Saharan African Countries (Angola, Chad, Equatorial Guinea, Gabon, Libya, Nigeria and Sudan) over the period 1990-2023 are given in Table 1.

Table 1

Data description and sources

Variables	Descriptions	Sources
GDP growth	GDP growth rate	WDI
Inf	Inflation Rate	WDI
Reer	Real effective exchange rate	WDI
Exp	Export of goods and services (USD)	WDI
Uemp	Unemployment rate	WDI
Gcf	Gross capital formation (USD)	WDI
Labf	Labour Force participation rate	WDI
Hcap	Human capital: Secondary school enrolment rate	WDI

Notes: WDI refers to World Development Indicators (2023).

Theoretical Framework and Empirical Model Specification

The starting point of the theoretical framework on economic growth is the neoclassical theory propounded by Solow (1956) and Swan (1956) which comprises a series of equations depicting the relationship between capital goods, labor-time, output, and investment. The divergence in capital formations explains the differences in economic growth across countries. The new growth theory (endogenous) emphasizes human capital development in forms of education, training, and technological advancement for the world market, and this account for its continued relevance. Empirical researches have attempted to study economic growth within the neoclassical framework. A production function is represented as output (Y) as a function of capital (K) and labor (L).

$$Y = AF(K, L) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

This growth model was later extended by Mankiw et al. (1992) to include human capital. The growth model appears in the general form as:

$$Y_t = A_t K_t + H_t + L_t + e_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

where Y_t is the aggregate output, A_t is the productive factor, K_t is the physical capital stock, L_t is the labor force employed, H_t is the human capital stock, e_t is the error term while t is the time period.

$$GDP_{growth} = \beta_o + \beta' X_{it} + \lambda_i + \varepsilon_t + U_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

The GDP growth denotes the growth rate of country i at year t; βo is the constant parameter; Xit denotes the vector of explanatory variables; λi is the unobservable country effect; εt is the unobservable time effect; and μit is the disturbance term. The econometric models that investigate the impact of foreign trade on economic growth for 7 sub-Saharan Africa countries is presented below;

$$GDP_{growth} = \beta_O + \beta_1 Inf_{it} + \beta_2 Reer_{it} + \beta_3 Exp_{it} + \beta_4 Uemp_{it} + \beta_5 Gcf_{it} + \beta_6 Hcap_{it} + \beta_7 Labf_{it} + \mu_{it} \ldots. (4)$$

In equation (4,), cross sections are donated by subscript i (where i=1,2,3, 4,…,N) and time period by subscript t (where t=1,2,3,4,…,T), μ is the stochastic random

disturbance, βo is the constant parameter and βs are coefficients to be estimated. The specifications comprise GDP growth as a dependent variable and seven independent variables; Inflation, Real effective exchange rate, Export, Unemployment, Gross capital fixed formation, Human capital and Labour force will be used as explanatory variables. The variables selected for the model are based on the growth theory and extant literature.

Estimation Procedures

Cross-sectional Dependency Test.

The Pesaran & Chudik (2015) test for weak cross-sectional dependency was used in this study. A significant body of literature in the panel analysis concluded that cross-section dependencies are likely to be occurred in panel data which may occur as a result of common shocks and unobservable components such as oil price fluctuations and global financial crises that become part of the error term.

Panel Unit Root.

The unit root is the test for data stationarity. It checks the characteristic properties of the variables of interest to avoid the problem of spurious regression estimations associated with non-stationary of the series. Pesaran (2007) CADF panel unit root test was used in the study.

Augmented Mean Group (AMG) Estimator.

The AMG estimator served as an alternative to Pesaran (2006) common correlated effect (CCE) estimator, it solves the problem of cross-section dependence (CSD), heterogeneous impact across panel members, time-invariant unobservable and problem of identification as it allows for dynamics/persistence (i.e the inclusion of lagged value (s) of the dependent variable into the model).

Data Analysis and Discussions

Table 2

Pesaran Test for weak Cross-Sectional Dependence

Variables	CD Statistics	Decisions
GDPgrowth	42.513***	Cross-sectional dependence detected
Infl	2.383***	Cross-sectional dependence detected
Reer	139.171***	Cross-sectional dependence detected
Exp	5.747***	Cross-sectional dependence detected
Uemp	138.285***	Cross-sectional dependence detected
Gcf	16.138***	Cross-sectional dependence detected
Labf	24.732***	Cross-sectional dependence detected
Hcap	77.949***	Cross-sectional dependence detected

The Table 2 depicts Pesaran (2015) test for weak cross-sectional dependence results. The probability values of all the variables are statistical significance at 1% level. Thus, there is a presence of cross-sectional dependence among the cross sections under investigation. This connotes that the dynamics of the variables are likely to have spatial spillover effect or driven by common factor(s) across the countries.

Table 3

Pesaran CADF Unit Root Test Results

Variables	Levels			First Difference			Order of integration
	T-bar	Z[T-bar]	P-val.	T-bar	Z[T-bar]	P-val.	
Gdpgrowt	-5.861	-24.152	0.000	-6.420	-27.950	0.000	I(I)
Infla	-3.609	-8.835	0.000	-4.758	-16.645	0.000	I(I)
Reer	-2.314	-0.030	0.488	-3.911	-10.890	0.000	I(I)
Exp	-2.209	0.689	0.755	-3.664	-9.208	0.000	I(I)
Uemp	-2.624	-2.135	0.016	-4.038	-11.754	0.000	I(I)
Gcf	-3.370	-7.211	0.000	-4.785	-16.833	0.000	I(I)
Labf	-1.900	2.786	0.997	-3.517	-8.209	0.000	I(I)
Hcap	-2.392	-0.557	0.289	-3.422	-7.565	0.000	I(I)

Table3 shows the findings of Pesaran (2007) CADF panel unit root. The cross-sectional dependence among the series are consider in this test, the result shows that all the variables have same order of integration i.e I(1). The probability values of all the variables are not significant at level values, meaning that all series are non-stationary at levels. At the first difference, P-values of all the variables became significant at 1 %, meaning the series are integrated of the first order one or I(1). The values of test statistics are less than the critical values at 1 % for all the variables.

Table 4

Relationship between foreign trade and economic growth in SSA countries using Augmented Mean Group.

Dependent Variable: GDP growth

Gdpgrowth	Coef.	Std. Err.	z	P>[z]	[95% Conf.	Interval]
Infl	-1.216884	.6305002	-1.93	0.054	-2.452642	.0188733
Reer	-.0293208	.0161411	-1.82	0.069	-.0609567	.0023152
Exp	.0479088	.0115712	4.14	0.000	.0252297	.0705879
Uemp	-1.379655	.41321964	-3.34	0.001	-2.189551	-.5697598
Gcf	.044532	.0112463	3.96	0.000	.0224897	.0665744

Gdpgrowth	Coef.	Std. Err.	z	P>[z]	[95% Conf.	Interval]
Labf	-2.185275	1.422254	-1.78	0.076	-5.312273	.2628624
Hcap	.0463678	.0104224	4.45	0.000	.0259402	.0667954
Common Dynamic	.9743371	.2536543	3.84	0.000	.4771838	1.47149
Constant	-.3188446	.118415	-2.69	0.007	-.5509337	-.086755
Observations	231					
Countries	7					
R-square	0.214					
Wald statistics	17.45					
P-value of Wald stat	0.001					

The coefficient of the common dynamic process is significant, this implies the presence of cross-sectional dependence. The result shown in table above revealed that Inflation rate (Infl) was found to be inversely related to GDP growth this is in line with the finding of Ogosi et al. (2022). From the result, 1% increase in inflation rate would bring about 121.6% decrease in GDP growth rate. However, the result is not statistically significant at 5% level of significance since the probability value of 0.054 is greater than 5%. Hence, Inflation is not a major determinant of economic growth in the selected SSA countries.

The coefficient of real effective exchange rate (Reer) is negative and statistically insignificant at 5% level, although the finding is inconsistent with the result of Jabaru and Jimoh (2021) who had a positive impact of exchange rate on GDP. By implication, rise in Reer results to decline in economic growth and decrease in Reer leads to rise in economic growth. This connotes that devaluation results to decrease in economic growth in selected sub-Sahara African countries during the period under investigation. Most of these countries are import dependent, as such devaluation will lead to reduction in consumption and fall in economic growth. The coefficient value of export (Exp) is positive and statistically significant at 1% level which is consistent with the findings of Iballi, Smajli and Ziberi (2022), Oyebowale and Algarhi (2020) and Omar and Nor (2020). This indicate that an increase in the countries volume of exports will spurs growth the region. Strong commodity prices encouraged growth in oil exporting countries; Nigeria and Angola.

Unemployment rate (Uemp) is negatively and statistically significant in predicts economic growth in the countries selected, with a coefficient of -1.379655 and a p-value of 0.001, this result is not consistent with the finding of Omar and Nor (2020) who reported a positive and significant effect of unemployment on economic growth. As such unemployment has a negative influence on economic growth. A country that

producing a below capacity will stand to lose efficiency in production and international competitiveness. Moreover, Gross capital formation (Gcf) positively affects economic growth which is in line with the finding of Oyebowale & Algarhi (2020). The coefficient is positive and statistically significant. The finding conforms to the submission of the theories of economic growth which posits that increase in capital spurs economic growth.

The coefficient of Labf is negatively related to economic growth, this result is inconsistent with the finding of Günay and Yenilmez (2024). The negative impact of the Labf shows the prevalence of unproductive labor force. In most of the sub-Sahara African countries, unskilled labor constitutes greater part of the labor force. However, the coefficient of Human capital (Hcap) is positive and statistically significant. Therefore, human capital has significant impact on economic growth in the countries considered.

The R-square from the result shows that GDPgrowth is explained with about 23% of the explanatory variables 21%. Finally, the probability value of Wald statistics is also significant at 1% level, this shows that the AMG model has good fit and the estimates are valid for drawing policy conclusions.

Conclusion and Recommendation

This study examined the impact of macroeconomic variables on economic growth in 7 Sub-Saharan African countries from 1990 to 2023. The findings revealed that inflation and unemployment rates hinder economic growth, while exports, gross capital formation, and human capital drive growth. The results also showed that real effective exchange rate and labor force participation rate have a negative but insignificant effect on economic growth. Overall, the study highlights the importance of macroeconomic stability and strategic policy interventions in promoting sustainable economic growth in Sub-Saharan Africa. Based on the findings, the following recommendations are proposed:

1. Monetary policy: Central banks in SSA countries should implement policies to control inflation, maintaining price stability and promoting economic growth.
2. Investment in human capital: Governments should invest in education and training programs to develop a skilled workforce, enhancing productivity and economic growth.
3. Export promotion strategy: SSA countries should diversify their exports and implement policies to increase trade competitiveness, boosting economic growth.

4. Capital formation: Governments should create an enabling environment to encourage investment, infrastructure development, and capital formation, driving economic growth.
5. Labor market reforms: Policymakers should implement labor market reforms to address unemployment, promote job creation, and enhance labor productivity.

References

Aroride, O.R. & Ogunbadejo, H.K. (2014). Impact of macroeconomic economic policy on agricultural growth in Nigeria. *Journal of Agriculture and Vertinary Sciences, 3*(7), 11-46.

Biswas, S. and Saha, A.K. (2014). Macroeconomic Determinants of Economic Growth in India: a time series analysis. *Transaction on Economic Research, 1*(2), 31-43.

Dauda R.S. (2017). Poverty and Economic Growth. *Journal of Poverty, 21*(1), 61-79.

Ditzen, J. (2016). *Xtdcce: Estimating dynamic common correlated effects in Stata* (SEEC Discussion Papers, 1601). Edinburgh, England: Spatial Economics and Econometrics Centre, Heriot Watt University.

Glahe, R. G. (2005). *Macroeconomics: Theory and Policy,* Harcourt Brace Jovanovich Inc.8, 79-90

Günay, E.K. & Yenilmez, M.I. (2024). Analyzing Macroeconomic Indicators that May Affect Economic Growth in Sub-Saharan African Countries: A Panel Data Analysis in the Context of Income Level Classification (1990-2019). *MANAS Journal of Social Studies, 13*(2), 491-497.

Higgins, K. L. (2015). *Economic Growth and Sustainability: Systems Thinking for a Complex World*. San Diego: Academic Press.

Iballi, N., Smajli, R., & Ziberi, B. (2022). Key macroeconomic indicators of economic growth in the case of developing countries. *Journal of Governance and Regulation, 11*(4), 147–153. https://doi.org/10.22495/jgrv11i4art14

Jabaru, S. O., & Jimoh, K. (2021). Effect of selected macroeconomic variables on the Nigeria economy. *International Journal of Advanced Research*· DOI: 10.21474/IJAR01/11608 https://www.researchgate.net/publication /351634509.

Jhingan, M. L. (2015). *Macroeconomics theory, 10th Edition,* Vrinda Publication Ltd, New-Delhi

Mankiw, N.G., Romer, D. & Weil, D.N. (1992). A contribution to the empirics of economic growth. *Quarterly Journal of Economics, 107*(2), 407-437.

Mustapha, A.O., Mathew, I.E. & Oluwaseun, R.A (2017). The effects of Macroeconomic indicators on Economic growth of Nigeria 1970-2015. *American Journal of Theoretical and Applied Statistics,* 6(6), 325 334.

Ndambiri, H.K., Ritho, C., Ng'ang'a, S.I., Kubowon, P.C., Mairura, F.C., Nyangweso, P.M., Muiruri, E.M. & Cherotwo, F.H. (2012). Determinants of economic growth in Sub Saharan Africa: A Panel data approach. *International Journal of economics and management,* 2(2), 18-24.

Ogosi, F., Andem, F., Nkanor, W., & Zibigha, P. (2022). An examination of macroeconomic determinants of economic growth in Nigeria: A regression analysis model. *Journal of Economic and Sustainable Development, 10*(2), 45-59. http://www.globalscientificjournal.com/

Omar, M. S. & Nor, A. M. (2020). Macroeconomic variables and economic growth: The Malaysian perspectives. *International Journal of Academic Research in Business and Social Sciences, 10*(3), 272–280.

Oyebowale, A. & Algarhi, A. (2020). Macroeconomic determinants of economic growth in Africa. *International Review of Applied Economics,* 1-25.

Paul A. A & Akindele J. O. (2016). The impact of human capital development on economic growth in Nigeria: ARDL approach. *Journal of Humanities and Social Sciences, 21*(3)01-07.

Pesaran, M. H., & Chudik, A. (2015). Common correlated effects estimation of heterogeneous dynamic panel data models with weakly exogenous regressors. *Journal of Econometrics, 188*(1), 393-420.

Pesaran, M. H., & Smith, R. P. (1995). Estimating long run relationships from dynamic heterogeneous panels. *Journal of Econometrics, 68*(1), 79-113.

Sajo, I.A. & Li, B. (2017) Financial Development, Export and Economic Growth in Nigeria. *Theoretical Economics Letters, 7*, 2239-2254. https://doi.org/10.4236/tel.2017.77153

Solow, R. (1956). A Contribution to the Theory of Economic Growth. *The Quarterly Journal of Economics, 70* (1), 65-94.

Swan, T. (1956). Economic Growth and Capital Accumulation. *Economic Record, 32*(2), 334 361.

Ubaka, I.E, (2016). The effect of macroeconomic indicators on economic growth in petrol-Dollar economy: The Nigerian Experience. *International journal for Innovative research in Multidisciplinary field,2*(10).

World Bank (2020). *Global Economic Prospects:* https://www.worldbank.org/en/publicati on/global-economic-prospects.

World Development Indicators. (2023). *World development indicators.* Washinton, USA: The World Bank.