Globalization and Per Capita Income Growth in Emerging Economies

Ubong Edem Effiong[*]

Abstract*:* In this study, the efficacy of globalization in influencing income growth within the Sub-Saharan Africa (SSA) from 1982 to 2020 is being examined. The "Konjunkturforschungsstelle Globalization Index" (KOFGI) was used to measure globalization at the overall, economic, social, and political level, while income growth was captured using the growth rate of gross national income per capita. The data employed in the analysis were gotten from World Bank and KOFGI database. The analysis follows a sequential order of unit root test based on the augmented Dickey-Fuller, autoregressive distributed lag (ARDL) bounds test for cointegration, and error correction model. The unit root test revealed that the order of integration of the variables were mixed at levels and first difference. The bounds test showcased that all the dimensions of globalization exhibited long-run association with income growth. The short-run result indicated that globalization wielded a negative and significant effect on income growth. A unit percent increase in globalization put forth a 1.3818% decrease in income growth. In the long-run, globalization however exerted a positive but insignificant sway on income growth in the SSA. The implication of this is that though globalization poses a short-run negative impact on income growth, the SSA can move along the learning curve to derive some long-term benefits that emanate from global interactions. It becomes pertinent for the SSA to see globalization as a long-term avenue for propelling income growth, bearing in mind that the short-run negative effect can be corrected periodically as the economy moves along the learning curve of globalization.

Keywords: globalization; inequality; gross national income; Sub-Saharan Africa; KOF.

JEL classification: C82; D30; F02; F62; F63; F69; O55; N37.

[*] Department of Economics, University of Uyo, Nigeria; e-mail: *ubongeffiong3@gmail.com*.

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1. INTRODUCTION

The Sub-Saharan Africa has been open to international borders which influences its economic, social, cultural, and political activities. Such openness can have some implications on her macroeconomic variables like income, inequality, employment, and external balance. This has caused some researchers to investigate into how globalization can effect macroeconomic variables. This brought up diverse themes by different scholars who attempted to examine the effect of globalization on growth (see Dreher, 2003; Stiglitz, 2004; Samimi & Jenatabadi, 2014; Atan & Effiong, 2020; Effiong, 2021); effect of globalization on inequality (see Miller, 2001; Dreher, 2006; Goldberg & Pavcnik, 2007; Bergh & Nilsson, 2011; Atif *et al.*, 2012; Han *et al.*, 2012; Jaumotte *et al.*, 2013; Jin, 2014); effect of globalization on income distribution (Milanovic, 2002; Zhou *et al.*, 2011) and effect of globalization on industrialization (Kaya, 2010); and effect of globalization on unemployment (Moore & Ranjan, 2005; Mitra & Ranjan, 2010; Janiak, 2013; Adamu *et al.*, 2018; Altiner *et al.*, 2018; Atan & Effiong, 2020; Effiong *et al.*, 2020).

Globalization is a contentious issue. Globalization, interpreted as free trade, is internationally advantageous in raising national incomes, in line with classical and neoclassical literature on trade benefits. The discussion is centred on distributional consequences. The Stolper-Samuelson theorem, applied in a Heckscher-Ohlin framework, indicates that freer trade benefits relatively ample factors while hurting relatively scarce factors –Stolper and Samuelson (1941) cited in Potrafke (2014). Other income distribution impacts result from outsourcing, non-traded goods, and the trading of inputs.

Globalization has social justice implications because of economic distribution. Owing to increased rivalry between individuals, corporations, governments, and nations, critics of globalization have blamed it for permeable social security systems, poverty, social inequality, and shrinking government size and scope (Stiglitz, 2004; Heine & Thakur, 2011). Globalization's 'benefits include the halt of the "Cold War" and fast economic growth in some Asian countries (Potrafke, 2014). However, in developed nations, the financial crunch that was instigated in 2007 and growing economic disparity fuelled criticism of capitalism and globalization.

Globalization is a multidimensional idea that encompasses economic, social, and political implications beyond trade openness and capital flows. The Kearney/Foreign Policy Magazine globalization index, the CSGR Globalization index (Lockwood & Redoano, 2005) or the Global Index (Raab *et al.*, 2008), and the Maastricht Globalization Index (Martens & Zywietz, 2006; Martens & Raza, 2009; Figge & Martens, 2014) are examples of comprehensive indexes that encompass economic, social, and political dimensions. The KOF globalization index is used quite often among all the globalization index (Dreher & Gaston, 2006; Dreher *et al.*, 2008). The KOF index defines globalization consistent with Clark (2000) as "the process of establishing multicontinental networks of linkages among players, interceded by a variety of flows such as people, information and ideas, capital, and products" (Potrafke, 2014).

Globalization diverges from 'internationalization', 'liberalization', 'universalization' or 'Westernization' by defining globalization as "the spread of trans-planetary or supra-territorial relations amid people". Internationalization refers to "a growth in cross-national commerce and interdependencies"; "the process of reducing legally imposed barriers on the flow of resources between countries is known as liberalization"; "the process of disseminating

diverse things and experiences to individuals in all inhabited places of the globe is known as universalization"; while Westernization is defined as "a sort of universalization in which Western societies' social frameworks are diffused across the globe" (Scholte, 2008; Caselli, 2013; Gygli *et al.*, 2019). These concepts are meticulously interconnected and calls for a clear distinguish among them. It is worthy of note that "when using a pluralistic and multiscale definition of globalization, no differentiation between the aforementioned concepts is required" (Figge & Martens, 2014).

In line with the *KOF globalization index*, as earlier developed by Dreher (2006) captures globalization into three – *economic, social, and political dimensions*. The economic dimension encapsulates actual flows (trade, FDI, portfolio investment, and income outflows to overseas residents), and trade restrictions (concealed import blockades, average tariff rate, taxes on transnational trade, and capital account kerbs). The social dimension comprises data on personal contact (telephone traffic, transfers, transnational tourism, overseas residents, transnational letters), data on information movements (internet users, television, trade in newspapers), and data on cultural propinquity (number of McDonald´s restaurants, number of IKEA, trade in books). The political globalization index takes account of embassies in countries, membership in international organizations, participation in U.N. Security Council Missions, and international treaties (Gygli *et al.*, 2019). The overall index is made up of the three sub-indices. A principal component analysis is used to weight the sub-indices. The variance of the variables utilized is computed using all available data for each individual variable in the main component analysis. The bigger the variation of a single variable, the greater the variable's weight (see KOF Swiss Economic Institute, 2021, for detailed method of computation).

The trend in globalization within the Sub-Saharan Africa has maintained a rising trend over the years. In the 1970s, the index of globalization averaged 29.46% and increasing from 27.79% in 1970 to 30.89% in 1979; and growing at the rate of 11.16% between the two periods. The 1980s witnessed a steady rise in globalization as the index rose from 31.41% in 1980 to 32.66% in 1989, growing at the rate of 3.98% between the two period and averaging 32.23% in the 1980s. The 1990s diverged from the steady increase in the 1980s by reflecting a rising globalization trend. The index rose from 33.15% in 1990 to 39.43% in 1999 with a growth rate of 18.94% and averaging 36.15% within the 1990s. In the 2000s, 200 to 2009, the rising trend in the 1990s was intensified as the index amplified from 40.20% in 2000 to 46.73 in 2009, averaging 43.38% and growing at a rate of 7.72% between the two periods. Subsequent years, 2010 to 2020 was still marked with increasing globalization trend from 47.52% to 50.12% for the respective periods; averaging 49.36% with a 5.47% growth rate.

At the income level, greater oscillations were recorded within the income growth in the SSA. With a positive growth rate throughout the 1970s and an average growth rate of 15.43%, the region plunged into periods of negative income growth rates in the 1980s with an average of 5.12% being recorded. The situation worsened in the 1990s as the average income growth rate further plunged to 3.02% having a period of negative growth rate up to four different years. Significant improvements were recorded in 2000 to 2009 where the region recorded an average of 12.29% income growth rate. starting from 2010 and ending in 2020, the region recorded an income growth rate of 17.42% in 2010 but this oscillated and plunged to a negative growth rate to the tune of -5.21%; and recording an average growth rate of 3.59% within the period. Figure no. 1 presents this movement in the two variables over time.
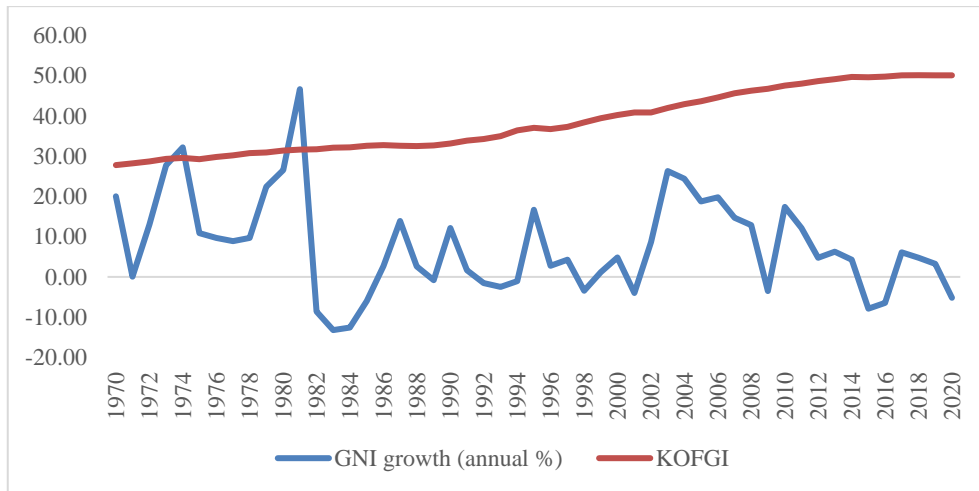
Figure no. 1 – Trend of GNI growth and Globalization in SSA, 1970 - 2020

Given the volatile trend in the income growth within the SSA and the rising trend in globalization, could it be that globalization has influenced income growth through the channel of the 'Stolper-Samuelson' theorem? It therefore becomes an imperative to investigate this empirically. The core aim of this study is to ascertain the influence of globalization on the growth of income within the Sub-Saharan African region. The specific objectives include:

a) To examine the effect of globalization on the growth of gross national income per capita,

b) To analyse the influence of economic globalization on the growth of gross national income per capita,

c) To investigate the sway of social globalization on the growth of gross national income per capita, and

d) To examine the effect of political globalization on the growth of gross national income per capita.

The paper is segmented into five major headings. The introduction which is section 1 is accompanied with the review of related literature in Section 2. Section 3 clearly defined the methodology of the research; while Section 4 presents the empirical findings. Then, Section 5 adumbrates the conclusion and recommendations of the study based on findings.

2. REVIEW OF RELATED LITERATURE

The pass through mechanism through which globalization can influence macroeconomic variables has been clearly defined in the literature. One of it is the 'Stolper-Samuelson' theorem emanating from the 'Heckscher-Ohlin' model (Jaumotte *et al.*, 2013). It states that "in a two-country two-factor structure, amplified trade openness (through tariff reduction) in a developing country where low-skilled labour is ample would upshot an increase in the wages of the low-skilled workers and a reduction in the compensation of the high-skilled workers, leading to a decline in income inequality" (Stolper & Samuelson, 1941).

When import tariffs are cut, the price of the (importable) high-skill intensive product drops, as does the compensation of the scarce high-skilled workforces, whereas the price of the (exportable) low-skill intensive good, for which the country has relatively abundant factors, rises, as does the reimbursement of low-skill workforces. In a sophisticated economy where high-skill components are plentiful, the opposite would hold true, with more openness leading to increased inequality.

The repercussions of the 'Stolper-Samuelson' theorem, particularly the enhancing effects of trade liberalization on income inequality in developing countries, have been intensively researched but have yet to be validated in large-scale investigations (Jaumotte *et al.*, 2013). Winters *et al.* (2004) present an outstanding review of the research and show that "there can be no clear general conclusion regarding the link between trade liberalization and poverty." Despite this proviso, the report substantially supports the theoretical presupposition that trade liberalization will alleviate poverty and provides little evidence for the argument that trade liberalization will increase inequality.

The growth in skill premium between skilled and unskilled employees observed in most emerging nations has been a special problem. This has resulted in a number of changes to the 'Heckscher-Ohlin' model, plus the addition of multiple countries, allowing poor (rich) countries to import low-skill (high-skill) intensive goods from other poor (rich) countries; the introduction of a continuum of goods, implying that "what is low skill-intensive in an advanced economy will be relatively highly skill-intensive in a less developed country" (Feenstra & Hanson, 1996); and the addition of intangible goods. Nonetheless, these additions have posed new difficulties for empirical testing.

Consequent upon these defies, a dissimilar literature has appeared arguing that "the 'Heckscher-Ohlin' model is fickle with contemporary inequality practise globally, not just in terms of inequality snowballing in developing countries, but also across multiple other dimensions – perhaps, factor reallocation appears to transpire principally within rather than across sectors" (Berman *et al.*, 1994); cum infinitesimal variations in the prices of unskilled labour (Lawrence & Slaughter, 1993). Modern theoretical and empirical research attempt to the reconsideration of the impacts of trade on inequality in the setting of heterogeneous enterprises and yield insights that differ significantly from those delivered by the 'Heckscher-Ohlin' model (Yeaple, 2005; Verhoogen, 2008; Egger & Kreickemeier, 2009).

Further empirical studies have been conducted at numerous levels. Milanovic (2002) investigated how globalization affects income distribution using data from the household budget survey, along with the sway of openness and FDI on the relative income shares of the low and high deciles. The study discovered some evidence that at extremely low average income levels, openness benefits the wealthy. As income levels surge, around the level of Colombia, Chile, or the Czech Republic, the situation changes, and the relative income of the poor and middle class grows in comparison to the affluent. Consequently, the effect of openness on a country's income distribution is determined by the country's prior income level.

Dreher (2003) offers a globalization index that considers the three dimensions: economic, social, and political. The aggregate index of globalization, plus sub-indices built to quantify the single components, are experimentally examined using panel data for 123 economies from 1970 to 2000. The findings suggest that globalization improves growth, but not to the amount required to significantly decrease poverty. Actual economic flows cum limits in industrialized nations are the variables most strongly linked to growth. Information flows, while less powerfully, also support growth, but political integration has little effect.

Dreher and Gaston (2006) were concerned with determining how globalization can influence income inequality in OECD and LDCs for 1970 through 2000 using panel data analysis. By dissecting globalization to the three dimensions of economic, social, and political, the economic factor of globalisation has increased industrial pay disparity in industrialized nations. To a lesser extent, the political and social components of globalisation appear to have contributed to rising pay disparity. In divergence, they discovered that globalisation had a minor influence on inequality in less developed nations. Grounded on the evidence, the conclusion that globalisation had no discernible influence on income inequality – at least as assessed by Gini coefficients – appears to be generally unarguable.

Kaya (2010) examined the impact of the most recent wave of economic globalization on manufacturing jobs in developing nations, utilizing data from 64 developing countries from 1980 to 2003. The findings demonstrated that manufacturing employment rose in the majority of emerging nations. First, consistent with this study, the degree of economic development as defined by GDP per capita is the most vital factor impacting the amount of manufacturing employment. Second, economic globalization has an impact on manufacturing jobs in emerging nations, mostly via trade. Consistent with the findings, the most recent wave of economic globalization has backed the enlargement of manufacturing employment in developing nations, however it is not the most important factor defining the size of manufacturing employment in these countries.

Bergh and Nilsson (2011) used GMM to investigate the relationship between globalization and within-country income disparity. They included various control variables and controlled for potential endogeneity. The research offered strong econometric analysis using a large panel data sample of 80 countries, spanning through 1970 to 2005. The KOF index, in particular, was used to quantify globalization, while the 'Fraser Institute's Economic Freedom Index' was used to evaluate economic disparity within countries. They found that economic freedom changes appear to enhance inequality mostly in the North, whereas social globalization is more relevant in the South. It has also been discovered that monetary, legal, and political globalization do not promote inequality.

Zhou et al. (2011) explored the influence of globalization on the distribution of income inequality in 60 industrialized, transitional, and developing nations. The Kearney index and the principal component index were employed as globalization indexes. It has been said that globalization may either reduce or increase economic inequality, and the majority of empirical data is disputed and inconclusive.

Atif et al. (2012) examined the influence of globalization on income inequality by estimating static and dynamic models for 68 developing countries' panel data from 1990 to 2010. Consistent with the findings, increased globalisation in developing nations leads to increased income disparity. However, several limitations in this research lead to the conclusion that possibly a basic, all-encompassing link does not exist in the issue. Reasonably, the influence of globalisation on income distribution may differ among nations, conditional upon the structures and institutions in place.

Han et al. (2012) used data from the Chinese Urban Household Survey from 1988 to 2008 to assess the influence of globalization on pay disparity. They investigate whether regions more open to globalization suffered greater changes in pay inequality than less-exposed regions in the aftermath of two trade liberalization shocks, Deng Xiaoping's Southern Tour in 1992 and China's entrance to the World Trade Organization (WTO) in 2001. At odds with the 'Heckscher–Ohlin' model's expectations, they discovered that WTO membership

was strongly related with growing pay disparity. They also show that both trade liberalizations increased within-region inequality by rising educational returns (returns to high school after 1992 and returns to college after 2001).

Jaumotte *et al.* (2013) investigated the link amid the rapid rate of trade and financial globalization and the growth in income disparity seen in most nations over the last two decades. Using collected panel data of 51 nations from 1981 to 2003, the research produced findings that suggest a stronger influence of technical advancement on inequality than globalization. The narrow total sway of globalization echoes a dual opposing tendencies: although trade globalization is linked with lower inequality, financial globalization - particularly foreign direct investment - is related with higher inequality.

Samimi and Jenatabadi (2014) evaluated the impact of economic globalization on Organization of Islamic Cooperation (OIC) countries' economic growth from 1980 to 2008. In addition, the study looked at the impact of complementing policies on the growth effect of globalization. It also looked at whether the growth effect of globalization is affected by a country's income level. The study presented evidence that economic globalization has a statistically significant influence on economic growth in OIC nations by employing the generalized method of moments (GMM) estimator within the framework of a dynamic panel data methodology. In keeping with the findings, this favourable effect is amplified in nations with better-educated employees and well-developed financial institutions.

Using the Pendroni cointegration test and the panel fully modified OLS, Ying *et al.* (2014) examined the effect of short-run dynamics and long-run equilibrium links flanked by globalization and the rise of the Association of Southeast Asian Nations (ASEAN) between 1970 and 2008. (FMOLS). The Pedroni cointegration test exposed a robust unified link amid globalization and economic growth, whereas the FMOLS shown that the elasticity of economic growth with reference to globalization is 1.48, indicating that globalization has a positive and noteworthy effect on economic growth. Furthermore, the study found that social globalization has a deleterious and considerable impact on economic growth, although political globalization has a negligible impact.

Kilic (2015) investigated the impact of globalization's three elements – economic, social, and political – on the economic growth of 74 developing nations from 1981 to 2011. The fixed effects least squares dummy variable panel regression and the Granger Causality test developed by Dumitrescu and Hurlin (2012) were used in this investigation. Consistent with the findings of this study, economic and political globalization have a favourable influence on economic growth, however social globalization has a detrimental impact on economic growth. Furthermore, the article revealed a bidirectional causative association between political and social globalization and economic growth, whereas social globalization and economic growth have a one-way causal relationship.

Majidi (2017) considered the effect of the three measurements of globalization on economic growth in one hundred developing countries from 1970 through 2014. The outcomes disclosed that political globalization wielded an undesirable and substantial influence on economic growth in upper middle income countries; while economic and social globalization had an inconsequential weight on economic growth. Further, the influence of overall and political globalization on economic growth in lower middle income countries is positive and substantial but economic cum social globalization have no noteworthy effect.

Hasan (2019) considered the waves of globalization on economic growth of South Asian countries from 1971 through 2014. The study used Pooled Mean Group (PMG) panel

cointegration model. The outcome designated that overall globalization, economic globalization, and political globalization stimulate economic growth in the long-run. However, the dimensions of globalization have no short-run momentous weight.

Atan and Effiong (2020) investigated the impact of globalization on economic growth in 25 African nations from 1991 to 2017. The Konjunkturforschungsstelle (KOF) indicator of globalization was used in this study. The panel unit root test, cointegration test, ARDL vector error correction mechanism (VECM), and Granger Causality test were used in the study. It was discovered that globalization has a favourable and considerable long-run influence on economic growth but a negative and small short-run effect. The Dumitrescu Hurlin Panel Causality Tests demonstrated a bidirectional association between globalization and African economic growth. The paper's policy implication is that African countries should recognize the long-term prominence of globalization as a potent force driving a modern economy; thus, coherent policies should be developed and geared toward managing the excesses of globalization in order to keep up with the ever-changing world.

Recently, Effiong (2021) focused on detecting the short-run and long-run sway of globalization (KOF globalization index) on economic development of Nigeria. The use of error correction mechanism, variance decomposition, and impulse response function, time series data from 1970 to 2017 were analysed. It was realized that economic globalization wielded a deleterious and momentous effect on economic development; while both political and social globalization exercised no substantial short-run effect. In the long run, economic globalization put forth a destructive and noteworthy effect on development; political globalization wielded a desirable and noteworthy effect on development; while social globalization wielded a deleterious and substantial effect on development.

Given the empirical studies conducted so far, majority of the studies focused outside the Sub-Saharan Africa from 1982 through 2020. Also, they are concerned with economic growth and income inequality. This paper fills this gap by considering whether globalization has been influencing income growth within Sub-Saharan Africa. In achieving this, the paper utilizes the autoregressive distributed lag approach since it can easily aid in the estimation of the short-run and long-run effect. The index of globalization to be used is the KOF globalization index earlier developed by Dreher (2006) while income growth is measured as the growth rate of gross national income per capita. The choice of this is to aid us to see how the effect of globalization tickles down to an individual in the Sub-Saharan Africa.

3. METHODOLOGY

3.1 The Model

Ascertaining the influence of globalization on any macroeconomic variable will require the construction of an index of globalization. In this study, globalization is the independent variable while income growth (growth rate of gross national income per capita) is the dependent variable. Our index of globalization utilized in this study is the one developed by Dreher (2006) which dissects globalization into economic, political, and social dimensions. Our model is constructed to capture the individual effect of the three dimensions and the overall effect of globalization on income growth. This lead to the construction of four different models by adapting the model of Dreher and Gaston (2006) as portrayed below.

Model I: To ascertain the influence of economic globalization on income growth

$$\text{GNIPC} = f(\text{EKOFGI, GDSAV, GFCF, INDVA, POPG})\text{-} \tag{1}$$

Model II: To ascertain the influence of social globalization on income growth

$$\text{GNIPC} = f(\text{SKOFGI, GDSAV, GFCF, INDVA, POPG}) \tag{2}$$

Model III: To ascertain the influence of political globalization on income growth

$$\text{GNIPC} = f(\text{PKOFGI, GDSAV, GFCF, INDVA, POPG}) \tag{3}$$

Model IV: To ascertain the influence of overall globalization on income growth

$$\text{GNIPC} = f(\text{KOFGI, GDSAV, GFCF, INDVA, POPG}) \tag{4}$$

where:
GNIPC = Gross National Income Per Capita (% annual growth rates)
KOFGI = Konjunkturforschungsstelle (KOF) Globalization Index
EKOFGI = KOF Economic Globalization Index
SKOFGI = KOF Social Globalization Index
PKOFGI = KOF Political Globalization Index
GDSAV = Gross Domestic Savings (% of GDP)
GFCF = Gross Fixed Capital Formation (% of GDP)
INDVA = Industry Value Added (% of GDP)
POPG = Population (Annual Growth Rates)

Equation (1) to Equation (4) are then transformed into their estimable form and are presented as follows:

$$\text{GNIPC} = \delta_0 + \delta_1\text{EKOFGI} + \delta_2\text{GDSAV} + \delta_3\text{GFCF} + \delta_4\text{INDVA} + \delta_5\text{POPG} + \mu_1 \tag{5}$$

$$\text{GNIPC} = \alpha_0 + \alpha_1\text{SKOFGI} + \alpha_2\text{GDSAV} + \alpha_3\text{GFCF} + \alpha_4\text{INDVA} + \alpha_5\text{POPG} + \mu_2 \tag{6}$$

$$\text{GNIPC} = \beta_0 + \beta_1\text{PKOFGI} + \beta_2\text{GDSAV} + \beta_3\text{GFCF} + \beta_4\text{INDVA} + \beta_5\text{POPG} + \mu_3 \tag{7}$$

$$\text{GNIPC} = \pi_0 + \pi_1\text{KOFGI} + \pi_2\text{GDSAV} + \pi_3\text{GFCF} + \pi_4\text{INDVA} + \pi_5\text{POPG} + \mu_4 \tag{8}$$

The variables are as earlier defined; δ_0, α_0, β_0, and π_0 are the constants which are expected not to be equal to zero; and δ_1 to δ_5, α_1 to α_5, β_1 to β_5, and π_1 to π_5 are the parameters to be estimated. In regards to the effect of globalization, the expected sign are as follows: $\delta_1 > 0$; $\alpha_1 > 0$; $\beta_1 > 0$ or < 0; and π_1 = unknown (Dreher, 2006).

3.2 Nature and Sources of Data

The data utilized is time series by nature starting from 1982 and ending in 2020. This time frame is only for the data used for econometric analysis. Meanwhile, some data starts

from 1970 while others starts from 1990. These once were mainly used to discuss some stylized facts. The data on gross national income were gotten from World Bank (2021) publication on "World Development Indicators", while data on globalization were derived from KOF Swiss Economic Institute (2021) as earlier developed by Dreher (2006) and expanded by Gygli *et al.* (2019) They dissect globalization into economic, social and political dimensions. The indicators ranges from 0 to 100 showing the magnitude to which an economy is globalized.

3.3 Analytical Technique

In the data analysis, the paper adopts the sequential order of analysis since we are using time series variables. At first, a test for the existence of unit root among the time series variables using the augmented Dickey-Fuller (ADF) unit root test under the constant and trend assumption is executed. The test equation is specified thus;

$$\Delta X_t = \alpha_0 + \delta t + \alpha_1 X_{t-1} + \sum_{i=0}^{K} \gamma_i \Delta X_{t-I} + \varepsilon_t \tag{9}$$

where X is the time series variable to be subjected to unit root test; α_0 is the constant; δ is the coefficient that captures the trend (t) assumption; k is the optimal lag length; i is the number of periods; Δ is the difference operator; the summation component captures the augmented component; and ε_t is the error term. The test is to allow us detect the order of integration of the variables for the reason of deciding the appropriate econometric approach to be used for further analysis. The null hypothesis is that there is unit root, expressed as $\alpha_1 = 1$. The rejection of the null hypothesis requires that the ADF statistic be more negative than the 5% critical tau (τ) statistic.

Next, the paper adopts the Bounds test for levels relationship. The test is used in the place of the conventional Engel-Granger cointegration test. The Bounds test is used when the time series variables are stationary at levels and first difference. The existence of cointegration spurred us into the final stage which entails the estimation of both the short-run dynamics and the long-run equilibrium estimates under the autoregressive distributed lag (ARDL) error correction mechanism (ECM). The model for the estimation of the ARDL short-run ECM is specified thus:

$$X_t = \varphi_0 + \sum_{i=1}^{p} \varphi_i \Delta X_{t-i} + \sum_{i=0}^{q} \gamma_i \Delta Y_{t-i} + \sum_{i=0}^{n} \vartheta_i \Delta Z_{t-i} + \emptyset ECM_{t-1} + \varepsilon_t \tag{10}$$

The variable X_t is income growth; Y_t is the different indices of globalization; Z_t are the vector set of control variables (gross domestic savings, industrial value added, gross fixed capital formation, and population growth); $\emptyset$ captures the speed of adjustment; ECM is the error correction mechanism; and ε_t is the error term. For the model to correct short-run disequilibrium, the error correction term, $\emptyset$, is expected to be negative and statistically significant.

4. EMPIRICAL FINDINGS

4.1 Stylized Facts

The stylized facts relevant in this study is the growth in income along with the globalization trends in the Sub-Saharan Africa (SSA). These variables are captured accordingly, and their pattern discussed over stated period.

4.1.1 Stylized Facts on Income Growth in Sub-Saharan Africa

The growth in gross national income within the SSA displayed some interesting dynamics in the 1970s, up to the 2000s. These changes are reflected in Table no. 1 where the GNI at current US dollar and its growth rate from 1970 to 2020 is captured.

Table no. 1 – Gross national income (GNI) and its growth in the SSA

Year	GNI growth (annual %)	GNI (current US$ billion)	Year	GNI growth (annual %)	GNI (current US$ billion)
1970	20.02	58,598.80	1996	2.78	371,805.27
1971	0.05	58,625.86	1997	4.25	387,622.26
1972	13.00	66,246.06	1998	-3.47	374,170.78
1973	27.76	84,635.94	1999	1.20	378,658.13
1974	32.22	111,901.59	2000	4.86	397,049.52
1975	10.87	124,063.91	2001	-3.98	381,227.99
1976	9.66	136,054.01	2002	8.62	414,075.28
1977	8.86	148,102.97	2003	26.32	523,061.71
1978	9.71	162,479.19	2004	24.44	650,890.06
1979	22.39	198,858.70	2005	18.78	773,146.21
1980	26.58	251,720.32	2006	19.75	925,851.98
1981	46.66	369,177.38	2007	14.73	1,062,269.13
1982	-8.59	337,458.85	2008	12.89	1,199,206.74
1983	-13.22	292,861.46	2009	-3.52	1,156,996.36
1984	-12.58	256,016.97	2010	17.42	1,358,506.92
1985	-5.98	240,699.46	2011	12.17	1,523,842.00
1986	2.65	247,087.88	2012	4.78	1,596,661.54
1987	13.87	281,356.20	2013	6.25	1,696,382.61
1988	2.59	288,629.92	2014	4.30	1,769,287.14
1989	-0.81	286,305.72	2015	-7.87	1,630,068.96
1990	12.13	321,040.51	2016	-6.42	1,525,403.67
1991	1.65	326,325.41	2017	6.07	1,618,017.38
1992	-1.50	321,435.26	2018	4.72	1,694,440.65
1993	-2.50	313,389.02	2019	3.28	1,750,081.43
1994	-1.08	310,013.15	2020	-5.21	1,658,883.46
1995	16.69	361,744.38			

Source: World Bank (2021)

In the 1970s, the SSA recorded a positive growth in GNI throughout the period, averaging 15.45% with the highest growth rate of 32.22% recorded in 1974. This positive growth continued till the early 1980s where the region recorded a huge growth rate of 46.66% in 1981. Thereafter, the region plunged to a negative growth rate in GNI for four consecutive

years (1982 to 1985) with an average growth rate of -10.90%. subsequently, a recovering was recorded for three consecutive years (1986 to 1988) where the region recorded a positive growth rate of GNI to the tune of 6.37% on the average before plunging back to a negative growth rate of -0.81% in 1989. The early period of the 1990s (1990 and 1991) was marked with improvements, though this was wiped out for three consecutive years of negative GNI growth (-1.50% in 1992; -2.50% in 1993; and -1.08% 1994). This was followed by a positive growth rates of 4.29% from 1995 through 1999 though with a negative growth rate of -3.47% as at 1998.

In the 2000s, the SSA recorded a positive growth in GNI from 2000 through 2014 with exception of 2001 and 2009 where the region recorded a negative growth rate of -3.98% and -3.52% respectively. Within this period, the growth rate of GNI averaged 11.19% with the highest growth rate of 26.32% recorded in 2003. From 2015 to 2020, there has been greater volatility in the growth rate of GNI within the SSA, marked with three years of negative growth (20015, 2016, and 2020) and three consecutive years of positive growth rates (2017, 2018, and 2019). Within this period, GNI growth averaged -0.90% which is quite low and reflects a deteriorating income growth within the SSA in recent years.

To narrow down on the how much of the income could be attributed to each individual in the SSA, the GNI per capita is utilized. Table no. 2 reflects the value of the GNI per capita at 2015 constant US$ along with its growth rate for 1982 to 2020.

Table no. 2 – GNI per capita and its growth rates in the SSA

Year	GNI per capita (constant 2015 US$)	GNI per capita growth (annual %)	Year	GNI per capita (constant 2015 US$)	GNI per capita growth (annual %)
1982	1,304.77	-2.85	2002	1,197.04	4.96
1983	1,221.26	-6.40	2003	1,221.13	2.01
1984	1,213.86	-0.61	2004	1,268.65	3.89
1985	1,195.10	-1.55	2005	1,309.07	3.19
1986	1,174.83	-1.70	2006	1,382.01	5.57
1987	1,171.04	-0.32	2007	1,416.43	2.49
1988	1,201.83	2.63	2008	1,446.36	2.11
1989	1,186.96	-1.24	2009	1,456.65	0.71
1990	1,187.53	0.05	2010	1,486.82	2.07
1991	1,163.41	-2.03	2011	1,509.12	1.50
1992	1,140.06	-2.01	2012	1,532.26	1.53
1993	1,105.80	-3.00	2013	1,569.30	2.42
1994	1,096.08	-0.88	2014	1,625.23	3.56
1995	1,100.72	0.42	2015	1,637.51	0.76
1996	1,124.83	2.19	2016	1,621.26	-0.99
1997	1,133.01	0.73	2017	1,608.29	-0.80
1998	1,129.32	-0.33	2018	1,598.81	-0.59
1999	1,125.64	-0.33	2019	1,605.61	0.43
2000	1,110.14	-1.38	2020	1,537.35	-4.25
2001	1,140.44	2.73			

Source: World Bank (2021)

With the dynamics in population growth within the SSA growing at an average of 2.76% (see Figure no. 2), it is worthy to note that such growth in population will affect how much of the GNI goes to each individual if such population growth in not matched with increasing GNI.
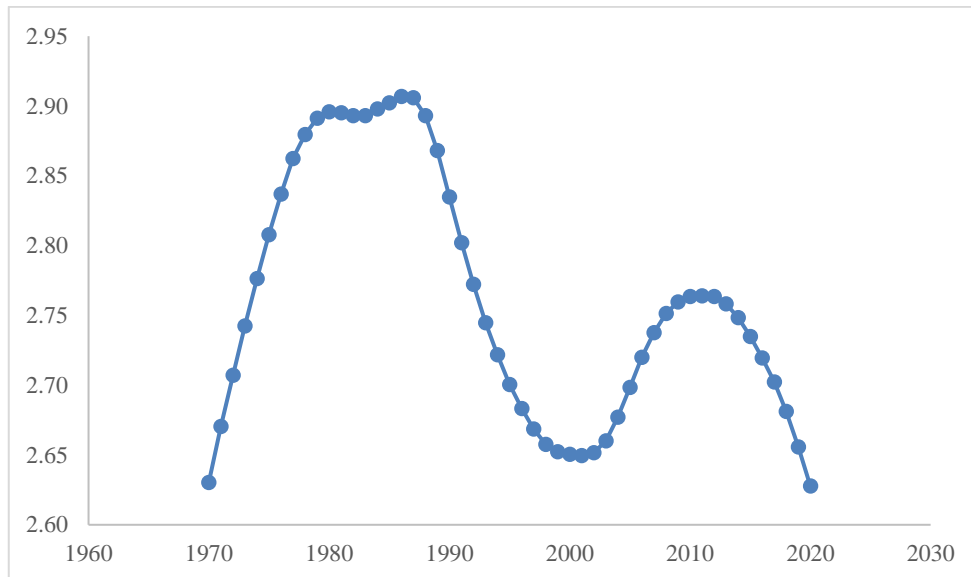

Figure no. 2 – Population growth rates in the Sub-Saharan Africa (1970 – 2020)

The GNI per capita (constant 2015 US$) declined from US$1,304.77 in 1982 to US$1,187.53 in 1990 and recording an average negative growth rate of -1.33%. This negative growth rate was quite pronounced as the SSA recorded a negative growth rate for six consecutive years (1982 – 1987) before a recovery to a tune of 2.63% in 1988 which was reversed in 1989 to a negative growth rate of -1.24% and then a positive growth of just 0.05% in 1990.

Further decline was recorded in the 1990s as the GNI per capita (constant 2015 US$) declined from US$1,187.53 in 1990 to US$1,110.14 in 2000, with an average growth rate of -0.66% from 1991 to 2000. This period was marked with drastic decline in GNI per capita since it recorded negative growth rates for seven years out of the ten years' period. Meanwhile, the SSA experienced greater improvements in the GNI per capita growth from 2001 till 2015 as the region recorded a positive growth rate throughout the 15 years to a tune of 2.63% on the average. This was followed by a negative growth rate for three consecutive years (2016 – 2018) to a tune of -0.79% on the average; and then a recovery set in in as at 2019 where a growth rate of 0.43% was recorded, before a subsequent decline to -4.25% in 2020. This negative growth in recent years reflects the declining standard of living in the Sub-Saharan Africa.

Using purchasing power parity (PPP) both at the constant and current prices, the GNI per capita revealed tremendous improvements over the years. Table no. 3 captures this behaviour.

Table no. 3 – GNI per capita purchasing power parity (PPP), (1990 – 2020)

Year	GNI per capita, PPP (constant 2017 international $)	GNI per capita, PPP (current international $)	Year	GNI per capita, PPP (constant 2017 international $)	GNI per capita, PPP (current international $)
1990	2,770.06	1,695.59	2006	3,238.49	2,746.92
1991	2,715.01	1,728.69	2007	3,318.85	2,890.00
1992	2,665.01	1,686.73	2008	3,384.49	3,007.39
1993	2,589.52	1,684.94	2009	3,393.49	3,043.97
1994	2,569.33	1,700.90	2010	3,458.15	3,154.53
1995	2,586.08	1,776.91	2011	3,506.99	3,273.51
1996	2,646.35	1,834.37	2012	3,543.35	3,287.20
1997	2,671.98	1,898.95	2013	3,622.89	3,449.83
1998	2,667.78	1,912.24	2014	3,756.17	3,656.28
1999	2,660.76	1,938.19	2015	3,789.84	3,667.43
2000	2,630.45	1,967.50	2016	3,769.85	3,713.24
2001	2,700.16	2,053.91	2017	3,749.20	3,751.78
2002	2,818.81	2,159.83	2018	3,735.98	3,832.02
2003	2,876.04	2,230.05	2019	3,754.82	3,917.52
2004	2,982.26	2,374.44	2020	3,599.15	3,795.43
2005	3,075.11	2,533.80			

Source: World Bank (2021)

At the 2017 constant international price (in $), the GNI per capita PPP exhibited a decline from $2,770.06 in 1990 to $2,660.76 in 1999; averaging $2,654.19 and reflecting a negative growth rate of -3.95% from 1990 to 1999. Meanwhile, the declining trend continued till 2001 to a tune of $2,700.16 before a tremendous increase being recorded thereafter. It increased from $2,630.45 in 2000 to $3,789.84 in 2015, averaging $3,255.97 and growing at a rate of 44.08% between the stated years. This was followed with a decline in the PPP from $3,789.84 in 2015 to $3,599.15 in 2020 reflecting a negative growth of -5.03% between the stated period, and averaging $3,721.80 between 2016 and 2020.

At the current international price (in $), the GNI per capita at PPP rose from $1,695.59 in 1990 to $1,938.19 in 1999 averaging $1,785.75 with a growth rate of 14.31%. This was followed with a continuous increase to a tune of $3,043.97 in 2009, growing at a rate of 54.71% between 2000 and 2009. Subsequent increase was recorded between 2010 and 2020 where the GNI per capita PPP at current international price averaged $3,590.80 and growing between the same period at a rate of 20.32% within the same period.

4.1.2 Stylized Facts on the Level of Globalization in Sub-Saharan Africa

In consistent with Dreher (2006), Potrafke (2015) and Gygli *et al.* (2019) the Konjunkturforschungsstelle (KOF) globalization index is disaggregated into three – economic, social, and political. Table no. 4 captures the behaviour of these indices from 1982 to 2020.

Table no. 4 – Index of globalization within the Sub-Saharan Africa, 1982 – 2020

Year	KOF Globalization Index	KOF Economic Globalization Index	KOF Social Globalization Index	KOF Political Globalization Index
1982	31.71	34.76	24.04	35.73
1983	32.13	35.11	24.06	36.55
1984	32.21	35.66	24.07	36.88
1985	32.62	36.48	23.98	37.36
1986	32.78	35.93	24.00	38.31
1987	32.62	36.12	24.12	37.56
1988	32.50	36.05	24.16	37.20
1989	32.66	36.43	24.19	37.29
1990	33.15	36.71	25.14	37.49
1991	33.85	36.35	25.27	39.74
1992	34.27	36.97	25.76	39.91
1993	34.97	38.10	25.72	41.04
1994	36.42	40.78	25.62	42.73
1995	37.06	41.20	25.91	43.94
1996	36.76	39.77	26.67	43.77
1997	37.26	40.02	27.08	44.60
1998	38.38	40.82	27.54	46.67
1999	39.43	41.34	28.66	48.23
2000	40.20	43.12	29.14	48.37
2001	40.88	43.41	30.17	49.06
2002	40.85	43.29	31.21	48.14
2003	41.94	43.13	32.46	50.30
2004	42.96	43.07	33.65	52.20
2005	43.68	43.50	34.63	52.99
2006	44.57	43.51	36.12	54.23
2007	45.66	44.35	37.32	55.46
2008	46.29	43.61	39.15	56.24
2009	46.73	43.48	40.56	56.33
2010	47.52	44.85	41.63	56.34
2011	48.04	45.59	42.73	56.10
2012	48.67	45.58	43.71	57.01
2013	49.16	45.87	44.55	57.36
2014	49.69	45.85	44.85	58.61
2015	49.65	44.95	45.08	59.15
2016	49.79	45.01	45.09	59.46
2017	50.10	45.04	45.16	59.98
2018	50.13	45.52	45.08	59.72
2019	50.11	45.28	45.12	59.85
2020	50.12	45.40	45.10	59.78

Source: KOF Swiss Economic Institute (2021)

The level of globalization has been maintaining a rising trend given the need for global interactions among different economies of the world. This is also reflected in the globalization trends in the SSA. The SSA witnessed a rising globalization as reflected in KOF globalization index from 31.71% in 1982 to 33.15% in 1990. This was followed by a 40.20% and 47.52% in 2000 and 2010 respectively. This rising trend continued steadily reaching an all-time high of 50.13% in 2018. Other dimensions of globalization follow similar trends as observed in their rising values over the years. Figure no. 3 reflects on the rising trends of globalization at the economic (EKOFGI), social (SKOFGI), and political (PKOFGI) dimensions along with the overall globalization level (KOFGI).
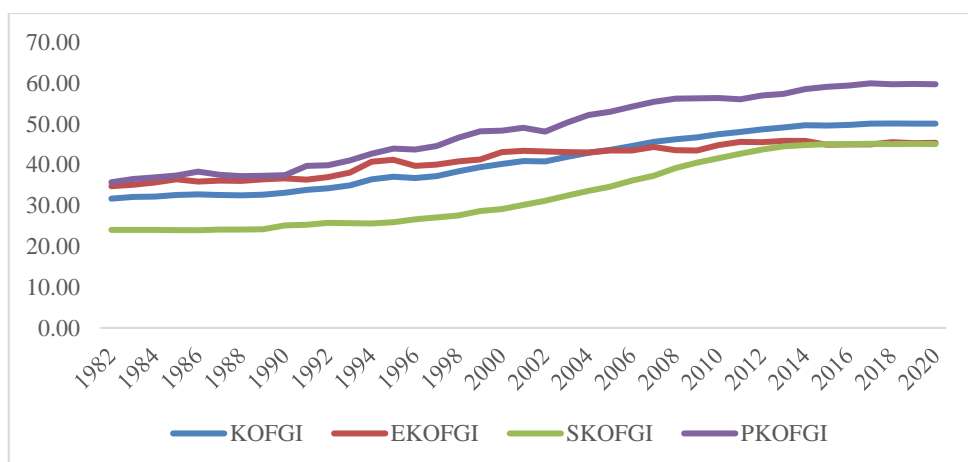
Figure no. 3 – Globalization trends in the Sub-Saharan Africa, 1982 - 2020

In line with Figure no. 3 which is derived from Table no. 4, political globalization index is observed to have a leading rising trend over the years while social globalization index has been the least until recently where it seems to measure up with economic globalization index. Economic globalization index rose from 34.76% in 1982 to 36.71% and 43.12% for 1990 and 2000 respectively. This was followed by a further increase to 44.85% and 45.52% for 2010 and 2018 respectively. Political globalization index seems to be the fastest growing index as it rose sharply from 35.73% in 1982 to 48.37% in 2000 before surging to 56.34% and 59.98 for 2010 and 2017 respectively. Social globalization index has been slow in the 1980s and 1990s standing at 24.04% in 1982 and rising steadily to 29.14% in 2000. The increase persisted to 41.63% in 2010 45.08% in 2018.

Whether this rising trend has had any significant influence on the income growth of the Sub-Saharan Africa will be determined using further econometric analysis.

4.2 Descriptive Statistics

The descriptive attributes of our variables of interest are in Table no. 5 where the table captures both the measures of central tendency and the measures of dispersion.

Table no. 5 – Descriptive characteristics of the variables

	EKOFGI	KOFGI	PKOFGI	SKOFGI	GNIPC
Mean	41.33	40.96	48.51	33.04	0.38
Maximum	45.87	50.13	59.98	45.16	5.57
Minimum	34.76	31.71	35.73	23.98	-6.4
Standard Deviation	3.81	6.79	8.62	8.40	2.49
Skewness	-0.43	0.05	-0.10	0.37	-0.25
Kurtosis	1.63	1.46	1.48	1.47	3.21
Jarque-Bera (J-B)	4.27	3.85	3.81	4.67	0.48
Probability	(0.12)	(0.15)	(0.15)	(0.10)	(0.79)
Observations	39	39	39	39	39

Source: author's computation

As captured in Table no. 5, economic globalization index, overall globalization index, political globalization index, and social globalization index averaged 41.33%, 40.96%, 48.51% and 33.04% respectively. Their respective standard deviation was 3.81%, 6.79%, 8.62%, and 8.40%. This gives their coefficient of variation to be 9.22%, 16.58%, 17.77%, and 25.42%. This reflects that social globalization index has the highest degree of variability over the study period. In regards to income growth, the growth rate of GNI per capita averaged 0.38% with a standard deviation of 2.49%; thus giving a coefficient of variability amounting to 655.26% indicating a very high degree of variability over the years. All the variables of interest are normally distributed since their J-B statistic are not statistically significant at the 5% level.

4.3 Unit Root Test

Given the fact that the paper deals with time series variables, the test for the stationarity of the series is sacrosanct. This is done using the Augmented Dickey-Fuller (ADF) test for unit root. The test is conducted using the constant and linear trend assumption, with the lag length being automatically selected using the Schwarz Information Criterion (SIC). Table no. 6 presents the result if the unit root test at level and first difference. For the null hypothesis of no unit root to be accepted, the ADF statistic must be negative and greater than the 5% critical tau statistic in absolute term (more negative).

Table no. 6 – The ADF unit root test result

Variables	ADF statistic at Level	Probability	ADF Statistic at First Difference	Probability	Order of Integration
GNIPC	-2.6652 [-3.5331]	0.2559	-8.9078 [-3.5366]	0.0000**	I(1)
KOFGI	-1.1525 [-3.5331]	0.9060	-9.9085 [-3.5366]	0.0000**	I(1)
EKOFGI	-1.5428 [-3.5331]	0.7965	-4.3136 [-3.5485]	0.0086**	I(1)
SKOFGI	-2.5991 [-3.5403]	0.2829	-10.2392 [-3.5485]	0.0000**	I(1)
PKOFGI	-1.1946 [-3.5331]	0.9774	-5.0633 [-3.5366]	0.0011**	I(1)
GDSAV	-1.3806 [-3.5578]	0.8475	-6.4469 [-3.5366]	0.0000**	I(1)
GFCF	-11.7711 [-3.5331]	0.0000**			I(0)
INDVA	-3.7311 [-3.5331]	0.0322**			I(0)
POPG	-3.4583 [-3.5443]	0.0600	-7.1596 [-3.5366]	0.0000**	I(1)

Note: ** denotes significance at 5% level, and 5% critical values are in the square bracket.
Source: author's computation

In Table no. 6, GNIPC only became stationary after first differencing as the ADF statistic (-8.9078) is more negative than the 5% critical value (-3.5366) and the probability of rejecting the null of no unit root is low. Intrinsically, GNIPC is stationary at first difference and it is an I(1) series. Similarly, KOFGI, EKOFGI, SKOFGI, PKOFGI, GDSAV, and POPG only became stationary after first difference. thus, they are also an I(1) time series variables. The variables

that were stationary at level were industrial value added (INDVA) and gross fixed capital formation (GFCF) since at their level, their ADF statistic were more negative than the 5% critical value. Thus, they are both an I(0) time series variables. It is worthy of note that some variables are stationary at levels while others at first difference. This diverse order of integration zero down to the use of the Autoregressive Distributed Lag (ARDL) approach in the analysis. This process will start from first detecting the existence of levels relationship (cointegration) among the variables in the model.

4.4 Bounds Test for Cointegration

As identified earlier, the bonds test for cointegration will aid us to determine if any form of long-run relationship exist among the variables given their diverse order of integration. This is done for the four models specified in this study. The test requires that the F-statistic must be greater than the I(0) and I(1) bounds values at the 5% level for cointegration to exist.

Table no. 7 – Bounds test result for Model I (Economic Globalization)

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	4.8245	10%	2.08	3.00
Number of Parameters (k)	5	5%	2.39	3.38
		1%	3.06	4.15

Source: author's computation

The result of Model I reflected in Table no. 7 indicates that the F-statistic (4.8245) is greater than the 5% critical I(0) value of 2.39 and I(1) value of 3.38. the null hypothesis of "no levels relationship" is disallowed. This validates the existence of levels relationship between income growth and economic globalization.

Table no. 8 – Bounds test result for Model II (Social Globalization)

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	3.8062	10%	2.08	3.00
Number of Parameters (k)	5	5%	2.39	3.38
		1%	3.06	4.15

Source: author's computation

In Model II, the result as showcased in Table no. 8 reveals that the F-statistic vale of 3.8062 is greater than both the I(0) value of 2.39 and I(1) value of 3.38 at the 5% level. the null hypothesis of "no levels relationship" is overruled. Hence, cointegration exist and there exist a long-run relationship amid income growth and social globalization.

Table no. 9 – Bounds test result for Model III (Political Globalization)

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	4.7924	10%	2.08	3.00
k	5	5%	2.39	3.38
		1%	3.06	4.15

Source: author's computation

The test for a long-run relationship between income growth and political globalization is evidenced in the result in Table no. 9 where the F-statistic (4.7924) is outside the I(0) and I(1) bounds value at the 5% level. We reject the null hypothesis of "no levels relationship" and conclude that cointegration exists amid the two variables.

Table no. 10 – Bounds test result for Model IV (Overall Globalization)

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	**Value**	**Significance**	**I(0)**	**I(1)**
F-statistic	5.4252	10%	2.08	3.00
k	5	5%	2.39	3.38
		1%	3.06	4.15

Source: author's computation

For the overall globalization index which is captured by the KOF globalization index, the result in Table no. 10 is a proof that cointegration exist since the F-statistic value of 5.4252 lies outside the I(0) and I(1) bound at the 5% level of significance. The null hypothesis is therefore rejected and evidence of cointegration flanked by globalization and income growth is being validated.

Given that all the index of globalization reported the existence of a long-run relationship with income growth, our analysis proceeds to determining both the short-run and long-run effect of globalization on income growth within the Sub-Saharan Africa.

4.5 ARDL Short-Run Error Correction Mechanism (ECM)

The short-run error correction model is estimated to capture the short-run dynamic effect of globalization on income growth within the SSA along with determining how such short-run distortions are corrected to establish long-run equilibrium. This is done in respect to the four models so specified in the study.

Table no. 11 – ARDL short-run error correction mechanism result for Model I

Dependent Variable: Income Growth (GNIPC)
Selected Model: ARDL(1, 0, 1, 2, 2, 1)

Variable	Coefficient	Standard Error	t-Statistic	Probability
D(GFCF)	-0.3229	0.1158	-2.7885	0.0102**
D(INDVA)	0.2277	0.1952	1.1661	0.2550
D(INDVA(-1))	-0.4798	0.2304	-2.0829	0.0481**
D(POPG)	-58.9357	51.2319	-1.1504	0.2613
D(POPG(-1))	148.0296	57.9807	2.5531	0.0175**
D(EKOFGI)	-0.9425	0.3766	-2.5031	0.0195**
ECM$_{t-1}$	-1.1855	0.1825	-6.4973	0.0000***
R-squared	0.6508	Durbin-Watson stat		1.6637
Adjusted R-squared	0.5809	S.E. of regression		1.4095

*Note: ** and *** captures significance at 5% and 1% level correspondingly.*
Source: author's computation

For Model I where the paper captures the effect of economic globalization (EKOFGI) on income growth, controlled with some other variables, the short-run dynamic effect of

GFCF put forth a deleterious and momentous effect GNIPC at the 5% level of significance. A unit percent change in GFCF reduces income growth by 0.3229% on the average in the short-run. Industrial value added (INDVA) wields a positive but insignificant short-run effect on income growth in the SSA. Such insignificant effect could be linked to the declining industrial production within the region coupled with heavy importation of manufactured goods. Meanwhile, the one-period lag in INDVA exercises a deleterious and significant effect on income growth by reducing income growth by 0.4798% on the average. Population growth put forth an undesirable but insignificant effect on income growth. Such negative effect implies that the population is not effectively utilized for creation of wealth given the pronounced unemployment rate in the region. Meanwhile, the one-period lag in population growth wields a positive and substantial effect on income growth in the SSA by increasing income growth by 148.03% on the average. This encapsulates that past population values were efficiently utilized as can be linked to the rising primary product exports before the discovery of oil in the region.

Economic globalization is observed to wield a negative and significant short-run effect on income growth in the SSA. This can be linked to the fact that globalization and trade liberalization has been pointed out to be driving force of inequality (Bergh & Nilsson, 2011); and that trade liberalization can weaken and destroy good jobs (Davis & Harrigan, 2010); and technological transfers can facilitate job destruction as enunciated by Schumpeter. As such, a one percent change in economic globalization reduces income growth by 0.9425% on the average.

The coefficient of the error correction term (ECM_{t-1}) is negative and statistically significant as required, implying that the model adjusts to long-run equilibrium. From the coefficient, 118.55% of the short-run distortions in income growth is corrected on a yearly basis. This is a reflection that it takes less than one year for equilibrium to be fully reinstated in the long-run. The r-squared is an indication that economic globalization with other explanatory variables account for 65.08% of the overall distortions in income growth in the short-run. the Durbin-Watson statistic of 1.6637 (which is approximately 2) validates the absence of serial correlation in the model.

Table no. 12 – ARDL short-run error correction mechanism result for Model II

Dependent Variable: Gross National Income Growth Per Capita (GNIPC)
Selected Model: ARDL(1, 3, 1, 0, 1, 2)

Variable	Coefficient	Standard Error	t-Statistic	Probability
D(GDSAV)	-0.0383	0.1094	-0.3497	0.7299
D(GDSAV(-1))	-0.0440	0.1099	-0.4004	0.6927
D(GDSAV(-2))	0.2251	0.0797	2.8239	0.0099**
D(GFCF)	-0.0794	0.2176	-0.3649	0.7187
D(POPG)	100.2160	20.0191	5.0060	0.0001***
D(SKOFGI)	0.8562	0.6505	1.3162	0.2016
D(SKOFGI(-1))	-1.6018	0.6279	-2.5511	0.0182**
ECM_{t-1}	-0.7715	0.1325	-5.8232	0.0000***
R-squared	0.6384	Durbin-Watson stat		2.0151
Adjusted R-squared	0.5481	S.E. of regression		1.3293

*Note: ** and *** captures significance at 5% and 1% level correspondingly.*

Source: author's computation

In Model II, gross domestic savings (GDSAV) along with its one-period lag exerts a negative but insignificant effect on income growth in SSA. However, its two-period lag wielded a positive and significant effect on income growth by increasing income growth by 0.2251% on the average. This is an indication that the present savings do not support investment for growth and wealth creation, while the previous period's savings were sufficient enough to drive wealth creation and increase income growth in the SSA. Gross fixed capital formation is noted to have a negative but insignificant short-run effect on income growth in the SSA while population growth wielded a positive and significant effect. A unit percent increase in population growth wielded a 100.22% increase in income growth. Social globalization put forth a positive but insignificant short-run effect on income growth; pointing out that social globalization is desirable but its sway in driving income growth is limited. Meanwhile, its one-period lag generated a negative and significant effect on income growth, reducing income growth by 1.6018% on the average.

The error correction term is negative and is statistically significant consistent with prerequisite, entailing that 77.15% of the short-run alterations in income growth is rectified in a yearly basis for equilibrium to be fully refurbished in the long-run. the r-squared indicates that social globalization along with other control variables account for about 63.84% of the overall discrepancies in income growth. The model is devoid of serial correlation since the Durbin-Watson statistic is approximately 2.0.

Table no. 13 – ARDL short-run error correction mechanism result for Model III

Dependent Variable: Gross National Income Growth Per Capita (GNIPC)
Selected Model: ARDL(1, 3, 1, 0, 1, 1)

Variable	Coefficient	Standard Error	t-Statistic	Probability
D(GDSAV)	-0.0771	0.1105	-0.6977	0.4924
D(GDSAV(-1))	-0.0276	0.1120	-0.2466	0.8074
D(GDSAV(-2))	0.2188	0.0808	2.7088	0.0125**
D(GFCF)	0.2040	0.2192	0.9307	0.3617
D(POPG)	103.4044	19.5712	5.2835	0.0000***
D(PKOFGI)	-0.4708	0.2303	-2.0438	0.0526*
ECM$_{t-1}$	-0.8466	0.1302	-6.5037	0.0000***
R-squared	0.6192	Durbin-Watson stat		2.1251
Adjusted R-squared	0.5404	S.E. of regression		1.3405

*Note: *, ** and *** captures significance at 10%, 5%, and 1% level correspondingly.*
Source: author's computation

The result for Model III as adumbrated in Table no. 13 indicates that gross domestic savings with its one-period lag put forth a negative but insignificant effect on income growth. Meanwhile, its two-period lag wielded a positive and substantial effect on income growth by increasing income growth by 0.2188% on the average. This behaviour can be linked to the case that a greater proportion of present savings in the SSA could utilized for consumption rather for the creation of more wealth, as opposed to the previous years' savings. Gross fixed capital formation is also noted to put forth a positive though insignificant effect on income growth in the SSA. Population growth wielded a positive and substantial short-run effect on income growth at the 5% level. Intrinsically, a unit percent change in population growth changes income growth by 103.40% on the average. This point to the importance of human capital in fostering growth and wealth creation; which has a direct link to enriching the citizens

through access to gainful employment. Political globalization wielded a negative and significant effect on income growth in the SSA. Such negative effect could be attributed to adoption of wrong political policies and ideas from other countries which could not have bearings within the SSA. A unit percent increase in political globalization reduces income growth by 0.4708% on the average.

The coefficient of the error correction term is negative and statistically significant at the 5% level. it follows from the coefficient that 84.66% of the total discrepancies in income growth is corrected every year for the restoration of long-term equilibrium. The r-squared signifies that political globalization along with other explanatory variables accounts for 61.92% of the total variations in income growth within the SSA for the study period.

Table no. 14 – ARDL short-run error correction mechanism result for Model IV

Dependent Variable: Gross National Income Growth Per Capita (GNIPC)
Selected Model: ARDL(1, 1, 3, 1, 0, 1)

Variable	Coefficient	Standard Error	t-Statistic	Probability
D(KOFGI)	-1.3818	0.3938	-3.5087	0.0019**
D(GDSAV)	-0.0429	0.1068	-0.4016	0.6917
D(GDSAV(-1))	-0.0588	0.1074	-0.5472	0.5895
D(GDSAV(-2))	0.1935	0.0776	2.4937	0.0203**
D(GFCF)	0.0928	0.2109	0.4401	0.6640
D(POPG)	107.0657	18.8552	5.6783	0.0000***
ECM_{t-1}	-0.9065	0.1310	-6.9198	0.0000***
R-squared	0.6409	Durbin-Watson stat		2.2038
Adjusted R-squared	0.5666	S.E. of regression		1.3017

*Note: ** and *** captures significance at 5% and 1% level correspondingly.*
Source: author's computation

In the overall result to ascertain the influence of globalization on income growth in the SSA, it is observed that globalization put forth a negative and significant short-run effect on income growth at the 5% level. A one percent increase in globalization wields a 1.3818% decrease in income growth. This negates the believe that "globalization suggests exciting business opportunities, efficiency gains from trade, more rapid growth of knowledge and innovation, and the transfer of such knowledge to developing countries facilitating faster growth, or the prospect of a world too interdependent to engage in war …" Todaro and Smith (2011) cited in Effiong Effiong (2021). This points out that globalization is not favourable for income growth within the SSA. As truly positioned by Yunus (2008), a Nobel laureate in 2008, "global trade is like a hundred-lane highway traversing the world. If it is a free-for-all highway, with no stop lights, speed limits, size restrictions, or even the lane markers; its surface will be taken over by the giant trucks from the world's most powerful economies" (Effiong, 2021); and that globalization and trade liberalization have been viewed to be a driving force in generating inequality in a country (Effiong *et al.*, 2020).

Gross domestic savings and its one-period lag exerted a negative but insignificant effect on income growth; while its two-period lag generated a positive and substantial effect by increasing income growth by 0.1935% on the average. Gross fixed capital formation wielded a positive but insignificant effect while population growth put forth a desirable and momentous effect on income growth. A unit percent increase in income growth is followed with a 107.07% increase in income growth on the average.

The error correction term reflects that on a yearly basis, 90.68% of the short-run inconsistencies in income growth is corrected so that a long-term equilibrium is reinstated. The r-squared is an indication that globalization along with other control variables account for 64.09% of the total discrepancies in income growth within the SSA in the short-run. The Durbin-Watson statistic of 2.20 validates absence of serial correlation in the model.

4.6 Long-Run Estimates

Since our bounds test revealed evidence of long-run relationship, the long-run estimates of the models are presented in Table no. 15.

Table no. 15 – Long-Run Result for Model I to Model IV

Dependent Variable: Gross National Income Growth Per Capita (GNIPC)

Variables	Model I	Model II	Model III	Model IV
Economic Globalization	0.2957 (0.0520)*			
Social Globalization		0.0553 (0.3281)		
Political Globalization			0.0823 (0.2024)	
Globalization Index				0.0958 (0.2136)
Gross Domestic Savings	0.5091 (0.0106)**	0.5599 (0.0071)**	0.5355 (0.0092)***	0.5461 (0.0079)**
Gross Fixed Capital Formation	-0.5076 (0.0013)***	-0.5586 (0.0007)***	-0.5406 (0.0009)***	-0.5481 (0.0008)***
Industrial Value Added	-0.3096 (0.3568)	-0.4571 (0.1997)	-0.3742 (0.3042)	-0.3986 (0.2647)
Population Growth	-2.5799 (0.6866)	-8.0738 (0.1839)	-5.8832 (0.3455)	-6.6068 (0.2807)
Constant	3.3177 (0.8911)	32.9409 (0.0753)*	22.5859 (0.2911)	25.2497 (0.2159)
R-Squared	0.4625	0.4138	0.4257	0.4243
Adjusted R-Squared	0.3810	0.3249	0.3387	0.3371
F-Statistic	5.6780	4.6582	4.8922	4.8644
Probability of F-Statistic	0.0007***	0.0025***	0.0019***	0.0019***
Durbin-Watson Statistic	1.6742	1.5721	1.6061	1.5984

*Note: *, ** and *** captures significance at 10%, 5% and 1% level correspondingly.*
Source: author's computation

For Model I, economic globalization is noted to wield a positive and significant long-run effect on income growth in the SSA at the 10% level of significance. The coefficient reflects that a unit percent increase in economic globalization will cause a 0.2987% increase in income on the average. Also, gross domestic savings put forth a positive and significant long-run effect on income growth – which indicates the role of savings in wealth creation and long term income growth. Gross fixed capital formation wielded a negative and significant long-run effect on income growth at the 1% level of significance. In that regards, a unit percent change in GFCF changes income growth in the opposite direction by 0.5076% on the average. This indicates that

the SSA's capital base is not sufficient to drive income growth. however, industrial value added and population growth put forth a negative but insignificant effect on income growth in the long-run. The overall model is statistically significant in explaining long-term income growth since the F-statistic is significant at the 1% level; the model explains 46.25% of the long-run variations in income growth; and the model is devoid of serial correlation.

For Model II, social globalization put forth a positive but insignificant effect on income growth which is similar to its short-run effect. Gross domestic savings wielded a positive and significant effect on long-term income growth while GFCF put forth a negative and significant effect. a unit percent increase in gross domestic savings increase long-term income growth by 0.5599% while a unit percent change in GFCF changes income growth in the opposite direction by 0.5586% on the average. Industrial value added and population growth wielded a negative though insignificant effect on income growth in the long-run. The significance of the F-statistic at 1% level indicates that the overall model is statistically significant; and the Durbin-Watson statistic of 1.57 imply that the model is devoid of serial correlation. The social globalization with other explanatory variables jointly explain 41.38% of the total variation in income growth in the long-run.

Consistent with Model III, political globalization also put forth a positive but insignificant long-run effect on income growth. Meanwhile, gross domestic savings exercised a positive and significant effect while gross fixed capital formation wielded a negative and significant effect. a unit percent increase in gross domestic savings increases income growth by 0.5355% which a unit percent change in GFCF changes income growth in the reverse order by 0.5406% on the average. Both industrial value added and population growth still maintained a negative but insignificant long-term effect on income growth in the Sub-Saharan Africa. The overall model is significant as reported by the significance of the F-statistic; free from serial correlation; and political globalization along with other explanatory variables jointly explains 42.57% of the total variation in income growth.

Lastly, it is observed that globalization (in general) wielded a positive but insignificant long-term sway on income growth. Gross domestic savings still account for a positive and significant effect while gross fixed capita; formation generated a negative and significant effect. a unit percent increase in gross domestic savings increases income growth by 0.5461% on the average; while a unit percent change in gross fixed capital formation changes income growth by 0.5481% on the average in a reverse order. Other variables exhibited a negative but insignificant effect. The model is generally significant since the F-statistic is significant and free from serial correlation since the Durbin-Watson statistic is 2.0 approximately. Globalization with other explanatory variables jointly explains 42.43% of the total variation in income growth in the long-run.

4.7 Major Findings

Given the analysis, the following are the major findings of the study:

a) Globalization generated a negative and significant short-run effect on income growth but such effect becomes positive but insignificant in the long-run.

b) Economic globalization generated a negative and significant short-run effect on income growth but such effect becomes positive and significant in the long-run.

c) Political globalization wielded a negative and significant short-run effect on income growth but its effect becomes positive but insignificant in the long-run.

d) Social globalization exerted a positive but insignificant short-run effect on income growth both in the short-run and in the long-run.

e) Gross domestic savings exerts a positive and significant effect on income growth in the short-run and in the long-run. This implies that developing and encouraging savings behaviour will aid in increasing income growth through wealth creation.

Such short-run negative effects of globalization on income growth portrays that globalization may not bring the immediate positive effect that is desired in the Sub-Saharan Africa. However, by moving along the learning curve of globalization and adopting suitable macroeconomic policies in the process, globalization is likely to bring forth the desired positive effect in the long-run.

5. CONCLUSION AND RECOMMENDATION

The issue of globalization has been addressed in various dimensions in the literature, focusing mostly on economic growth and income inequality. In this paper, the case of the Sub-Saharan Africa is considered where the paper explores how the concept influences income growth within the region from 1982 to 2020. The augmented Dickey-Fuller unit root test to ascertain the order of integration of our time series variables is used; the bounds test for cointegration to ascertain the existence of long-run equilibrium relationship; and the error correction model to capture how the short-run distortions are adjusted for the attainment of long-run equilibrium. The paper splits globalization into economic, social, and political dimensions and as well specified and estimated four models to capture their individual and aggregate effect on income growth within the SSA in both the short-run and in the long-run. At the individual level, the short-run result portrayed that economic globalization, political globalization, and one-period lag of social globalization wielded a negative and significant effect on income growth. Meanwhile, social globalization put forth a positive but insignificant effect on income growth. At the aggregate level, globalization is noticed to put forth a negative and significant short-run effect on income growth within the SSA. This points to the fact that increased globalization plunged income growth in the SSA in the short-run. Consequently, rising globalization will cause income growth to decline drastically in the short-run. In the long, all the dimensions of globalization (economic, social, and political) including the aggregate globalization wielded a positive effect on income growth. Meanwhile, only economic globalization wielded a significant influence. This points to the fact that though globalization may not be desirable in the short-run due to structural rigidities, it is quiet desirable in the long-run to drive income growth especially at the economic level.

Other key variables include gross domestic savings, gross fixed capital formation, industrial value added, and population growth. The short-run effect of gross domestic savings with its one-period lag is recorded to be negative but insignificant; while its two-period lag wielded a positive and significant effect on income growth. Both population growth and gross fixed capital formation put forth a positive and significant short-run effect on income growth of the Sub-Saharan Africa. This points out that increasing these variables will aid in increasing the income level of the SSA. In the long-run, gross domestic savings wielded a positive and significant influence on income growth. This point out the fact that savings will stimulate wealth creation which hitherto causes income to grow at a higher level. Population growth and industrial value added wielded a negative but insignificant long-run effect; while gross fixed capital formation wielded a negative and significant effect.

Going by the explanatory power of the models, economic globalization, social globalization, and political globalization along with control variables explained 65.08%, 63.84%, and 61.92% of the total variations in income growth in the short-run respectively. This points to the fact that economic globalization has a greater sway in influencing income growth in the Sub-Saharan Africa. This is because economic globalization cuts across trade liberalization, foreign direct investment, financial globalization, among others, which has greater positive externalities on modern economy. In the long-run, economic globalization, social globalization, and political globalization explained 46.25%, 41.38%, and 42.57% of the total variation in income growth respectively. Still, economic globalization still dominates as it holds a greater sway in influencing income growth within the region.

Given the findings of the study, this paper concludes that globalization is a crucial variable that pose a serious influence on the growth of the income within the Sub-Saharan Africa. Consequently, the promotion of economic globalization is of core importance in stimulating long-term income growth. This should be done bearing in mind that it has some short-run negative influence. However, it is worthy of note that the long-term benefit of economic globalization outweighs the short-run negative effect which can be corrected periodically as the economy moves along the learning curve of globalization.

ORCID

Ubong Edem Effiong (ID) https://orcid.org/0000-0003-4677-1268

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