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ARTICLE

Economic Globalization, Entrepreneurship and Welfare in African Oil Exporting Countries

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Abstract

The desire of policymakers in developing countries is to achieve rapid and sustainable economic growth. This is because achieving such growth will open diverse opportunities for people to be creative and productive. The need for these policies to accelerate the level of growth is not unconnected to the high unemployment rates, ravaged poverty, and rising inequality that led to low inclusive growth. To achieve the needed growth, there is a need for a resurgence in entrepreneurial activities and increased economic globalization. On this basis, the study examined the effect of economic globalization and entrepreneurship on GDP per capita in oil-exporting African countries. The research used ex-post facto research design. The study comprised 16 oil-exporting countries in Africa. The sample period is from 2006–2021. The study revealed that there is evidence that economic globalization and entrepreneurship significantly influence GDP per capita (Wald-test (6, 249) = 18.32, $p < 0.05$). The study concluded that economic globalization and entrepreneurship have a significant influence on GDP per capita in the selected oil-exporting countries in Africa. The study recommends that oil exporting African countries policy makers should change their centrally planned economies and hand more responsibility over to private sector players, with the government performing regulatory roles.

Keywords: *Economic Globalization, Entrepreneurship, GDP per person, Inclusive Growth, Oil Exporting Countries*

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1. Introduction

Recently, researchers and policymakers, including international organizations, have recently shifted their focus from "economic growth" to "inclusive growth." Growth that is distributed fairly throughout society and generates opportunity for everyone is known as inclusive growth. Simply put, progress is inclusive when it benefits

everyone (Osinubi & Olomola, 2020b). Increased entrepreneurial activity and economic globalization can lead to inclusive growth. Economic agents' lifestyles and consumer habits are impacted by economic globalization. By shifting economic gains from the most developed to the least developed, such as African nations, it alters

regional interactions and helps everyone in a community (Coulibaly et al., 2017; Ifeakachukwu, 2020).

Through significant increases in cross-border trade, information exchange, and foreign direct investment, economic globalization also has an impact on an economy's technology, innovation, and socio-political institutions. By improving relations between developed and poor nations, it creates "a great global community" (Coulibaly et al., 2017). Through entrepreneurship, economic actors have access to opportunities that allow them to foster equitable growth and raise productivity in the real sector. A healthy economy, according to Nica (2020), is characterized by a consistent process of new business development as well as an acceptable proportion of small and medium-sized firms. Entrepreneurship is viewed as a means of reducing poverty by generating jobs (Ajide, 2021; Legas, 2015).

The constant blending and mingling of regions, nations, and cultures through economic, social, and political institutions has inexorably raised both the absolute and relative living standards of human society. Globalization, namely economic globalization, has contributed significantly to this ongoing evolution, particularly in light of the enormous advancements that the industrial revolution brought forth. It has resulted in free trade and capital flows, migration opportunities, religion, work ethic, and mechanical or technological advancements, which have significantly defined global growth and development patterns since the mid-19th century, from an economic, social, cultural, and technical perspective.

Since then, economic globalization has seen numerous changes. Recently, this process of market liberalization and deregulation has led to more flexibility in trade restrictions and tariffs, a comparatively free flow of goods and services, the inflow and outflow of foreign investment, and technology spillovers that extend far beyond the national borders of our modern economies.

Economic globalization is a significant factor that has changed and is still changing the way economic agents live and shop, as well as their political, social, and even environmental reality. The economic effects of globalization are the main topic of this study. By utilizing several economic growth models, (Baldwin & Forslid, 2019; Dollar & Kraay, 2021) have shown that there is a connection between economic globalization and economic growth and development. Their considerations have led to the following two key findings: a movement opposed to economic globalization and a pro-globalist stance.

The empirical evidence on how entrepreneurship affects economic growth and development is strongly contradictory (Nnyanzi, Yawe, & Ddumba-Ssentamu, 2019). Although many academics have made the case that entrepreneurship helps to spur economic growth. The motivation for this study is in three folds. The first motivation of this study was that it explores the dynamic relationship between entrepreneurship, GDP per capita, and the oil-exporting nations of Africa. Previous research in this field has solely examined the connection between entrepreneurship and economic expansion (Peprah & Adekoya, 2020). Second, the amount of trade or capital movements is typically used as a proxy for globalization in studies. Furthermore, economic protection and capital control policies, which are variables based on policy, are not fully considered in previous studies. Our work used the KOF economic globalization index of (Dreher 2006; Dreher et al. 2008 & Gygli et al 2019). Thirdly, by utilizing suitable spatial econometric approaches and African data, this study evaluates cross-sectional dependence in the model.

It is on this premise that the study examined the effect of economic globalization and entrepreneurship on GDP per capita employed in Africa oil exporting countries. The structure of the current paper is as follows. The literature study on the connection between economic globalization, and entrepreneurship on GDP per capita is covered in Section 2. The estimating strategy, which comprises data definition and sources, model formulation, and a-priori criteria, is introduced in Section 3. Section 4 presents and discusses the findings, while Section 5 comes to a conclusion.

2. Literature Review

2.1 Theoretical Review

The Knowledge Spillover Theory of Entrepreneurship (KSTE)

The assumptions that knowledge spillovers occur automatically and that information directly translates into economic knowledge and macroeconomic growth are among the key criticisms of knowledge-based endogenous growth models (Audretsch et al., 2005; Braunerhjelm et al., 2010). According to the Knowledge Spillover Theory of Entrepreneurship (KSTE), entrepreneurs are the "missing link" in transforming knowledge into knowledge that is relevant to the economy and ultimately promotes growth (Braunerhjelm et al., 2010). Thus, according to Acs et al. (2013), the KSTE offers a framework that aids in comprehending the microeconomic underpinnings of the endogenous growth theory. Researchers can thus more effectively explain the

heterogeneity of regional and macroeconomic growth rates using the KSTE paradigm (Acs et al., 2013). Although new and small businesses often have invested a tiny number of resources (and money) in R&D activities, Audretsch (1995), who created the KSTE, made the initial observation that they are nevertheless capable of providing innovative goods and services.

According to Audretsch (1995), this result is a result of entrepreneurs' capacity to utilize information that has already been created by R&D-focused organizations, such as colleges and the R&D departments of major incumbent corporations. According to the logic of the KSTE framework, which links entrepreneurship with growth, entrepreneurs who enter the market by utilizing and commercializing ideas and information that have already been developed by established businesses act as a conduit for knowledge transfer. Additionally, Acs et al. (2018) contend that new entrepreneurial entry fosters inventive activity that leads to growth by acting as a conduit (the "missing link" for the spillover of knowledge).

KSTE focuses on how a knowledge-rich environment might affect an individual's cognitive function, particularly their capacity for opportunity perception and entrepreneurial skills, rather than on the specific traits of the entrepreneur (Audretsch et al., 2005; Busenitz et al., 2014). Researchers now see "entrepreneurial opportunities" as a crucial entrepreneurial feature and occasionally even attempt to define entrepreneurship by it according to the work of Kirzner (1999). For instance, Krueger (2003) believes that the essence of entrepreneurship is the discovery of possibilities.

The impact of context, such as the store of information generated elsewhere and not yet used, appears to have been overlooked in the group of research that accept the function of "opportunity". As was already said, the KSTE places a strong emphasis on the role that circumstance plays in influencing an individual's capacity to discover and exploit chances, in contrast to other entrepreneurship theories. According to Audretsch et al. (2005), the KSTE is able to endogenize the process of entrepreneurial entry and opportunity recognition by analysing how context, and specifically how the stock of existing uncommercialised knowledge and ideas in the market, influence an individual's decision-making toward entrepreneurship.

2.2 Empirical Review

A growing body of empirical research shows that entrepreneurship and economic growth are positively correlated, for example (Carree et al., 2007; Wong et al., 2005; King and Levin, 1993; Bassanini et al., 2001). By

establishing a favourable correlation between entrepreneurship and rapid growth and measuring entrepreneurship as self-employment, Carree et al. (2007) made an important contribution to the literature on entrepreneurship. The analysis is done by Carree et al. (2007) utilizing information from 23 OECD nations between 1972 and 2004. Audretsch et al. (2006) empirically demonstrate the presence of a link between entrepreneurship and intense growth, supporting the findings of Carree et al. (2007). After accounting for several forms of economic freedom metrics, the conclusion also suggests that the relationship between intense growth and self-employment is non-linear. This non-linear relationship, however, is only apparent when the preservation of property rights is a requirement for entrepreneurial activity.

Additionally, Bassanini et al. (2001) draw the conclusion that the OECD countries do not exhibit this link. The econometric approach places constraints only on the long-run coefficients, allowing short-term adjustments and convergence speeds to differ among countries. The findings support the significance of R&D activities, the macroeconomic climate, trade openness, and well-developed financial markets for growth in addition to the "main" influences of capital accumulation and skills contained in human capital. Additionally, they affirm that many policy impacts affect growth not only "directly," but also indirectly, by mobilizing resources for fixed investment. Additionally, the article presents some bivariate connections between OECD growth and product regulation measures. They offer some data to back up the claim that the detrimental effects of strict rules and administrative load on the effectiveness of the product marketplaces also have a detrimental effect on overall economic growth.

Wong et al. (2005) draw the conclusion that entrepreneurship has a favourable impact on GDP per capita growth for a sample of 37 nations. Instead of the GEM measure of entrepreneurship, like in Audretsch et al. (2006), it is used in this study. The measure of entrepreneurship is broken down into four divisions by Wong et al. (2005) necessary Total Entrepreneur Activity (TEA), opportunity TEA, high potential TEA, and overall, TEA. The outcome implies that fast-growing organizations, as opposed to new businesses in general, are what significantly contribute to intensive growth. As a result, the finding by Wong et al. (2005) gives policymakers direction for how to target entrepreneurial activation measures. The study, however, was unable to differentiate between the function of entrepreneurs in nations with various rates of economic growth. By offering an expansion to the growth model, Valliere and Peterson

(2009) continue the investigation begun by [Wong et al. \(2005\)](#). [Valliere and Peterson \(2009\)](#) cover 44 countries for the years 2004 and 2005, compared to [Wong et al. \(2005\)](#) selection of 37 nations. The GEM metric is employed to gauge entrepreneurship in the manner of [Wong et al. \(2005\)](#). [Valliere and Peterson \(2009\)](#) study tries to discern how various forms of entrepreneurship influence intensive growth because it uses a larger sample. The findings of Wong et al. are supported by [Valliere and Peterson \(2009\)](#) after adjusting for capital, labour, human capital, and interaction terms for economic rules (2005). However, only high-income countries show that high potential TEA has a substantial impact on intensive growth. Using a five-year lagged entrepreneurship variable, [Valliere and Peterson \(2009\)](#) come to the conclusion that there is a delay between entrepreneurship and rapid growth. Additionally According to [Abosede and Onakoya \(2013\)](#), entrepreneurship helps Nigeria's economy expand, particularly when it comes to inclusive growth. In an unbalanced panel setup, [Aparicio et al. \(2020\)](#) investigate the impact of social progress orientation (SPO) on inclusive growth via innovative and opportunity entrepreneurship in 63 countries. The results demonstrate that SPO has a major impact on entrepreneurial potential and innovation. Additionally, entrepreneurship encourages inclusive growth by lowering poverty.

But according to a number of studies, including [Salgado-Banda \(2007\)](#), [Wong et al. \(2005\)](#), and [Sabella et al. \(2014\)](#), entrepreneur development does not result in economic or inclusive growth. [Salgado-Banda \(2007\)](#) came to the specific conclusion that in OECD nations, self-employment is inversely linked with real GDP per capita. Similar to this, [Wong et al. \(2005\)](#) conclude that while high-growth entrepreneurship does guarantee economic growth, overall entrepreneurial activity does not. Additionally, [Sabella et al. \(2014\)](#) demonstrate that while economic growth occurs when new employment is generated, entrepreneurship activities have no discernible effect on economic growth.

Between 1996 and 2011, [Asongu and Nwachukwu \(2017\)](#) look at the impact of globalization on inclusive human development in 51 African nations. The results of this study show that globalization promotes inclusive human development in Africa using panel fixed effects and Tobit regressions. In a related study, [Asongu and Nwachukwu \(2017\)](#) use instrumental quantile regression to determine that globalization has a beneficial impact on inclusive human development. Using information from a sample of 11 nations spanning the years 1980 to 2015, [Hammudeh et al. \(2020\)](#) look into how globalization affects economic growth. The cross-sectional

dependency-autoregressive distributed lags (CS-ARDL) method is used in this study to examine the economic, political, and social aspects of globalization. The findings show that for the majority of the sample, there is a quadratic (nonlinear) U-shaped link between overall globalization (and its constituent parts) and economic growth. [Shittu et al. \(2020\)](#) investigate the effects of foreign direct investment (FDI), globalization, and political governance on economic growth in West Africa and discover that these factors have favourable effects on the region's economic development.

When [Nwofia and Aworinde \(2020\)](#) looked at the impact of economic globalization on Nigerian economic growth from 1970 to 2017, they discovered that it had a long-term, asymmetric cointegrating influence on economic growth. According to a related study by [Aremo and Aiyegbusi \(2011\)](#), globalization will eventually harm Nigeria's economic growth. In Nigeria between 1981 and 2018, [Ifeakachukwu \(2020\)](#) investigates the tripartite relationship between globalization, economic growth, and income inequality. According to the author, economic growth is ultimately caused by globalization in the long run. The study also demonstrates that economic expansion and globalization are important factors in inequality. [Loots \(2003\)](#) examines whether trade and financial liberalization brought about by globalization help South Africa's young economy grow. According to the report, globalization has a big impact on South Africa's economic expansion.

Despite the notion that because of its abundance in minerals and other natural resources, Africa should be the world's richest continent in terms of entrepreneurship, the region's record in this regard has been appalling. According to experts, there are many reasons for this appalling performance, including the fact that raw agricultural products are not sensitive to global prices, poor infrastructure, a lack of human and financial capital, unsuitable trade policies, poor management of human resources, and anti-entrepreneurship government policies ([Robson & Obeng, 2008](#)).

3. Methodology

3.1 Model Specification

The study addresses the impact of economic globalization and entrepreneurship on GDP per capita.

The model is given as:

$$LGDPPC_{it} = \alpha_0 + \alpha_1 ECOG_{it} + \alpha_2 ENTRE_{it} + \alpha_3 INF_{it} + \alpha_4 GQ_{it} + \alpha_5 AIDI_{it} + \alpha_6 OILP_{it} + U_{it} \quad (1)$$

Where LGDPPC represents the natural logarithm of Gross Domestic Product per capita, ECOG = Economic

Globalization, ENTRE = Entrepreneurship, INF = Inflation rate, GQ = Governance Quality, LAIDI = The natural logarithm of African Infrastructure Development Index, OILP = Oil Price. $\alpha_0 - \alpha_6$ represents the estimates, U is the error term, and it is the cross section and the time series.

3.2 Apriori Expectations

Apriori expectations of the models in term of the relationship between the parameters of the models and dependent variable GDP per capita are stated below:

$$\alpha_1 > 0, \alpha_2 > 0, \alpha_3 < 0, \alpha_4 > 0, \alpha_5 > 0, \alpha_6 > 0$$

From the above expression it is expected that economic globalisation ($\alpha_1 > 0$) has a positive relationship with the gross domestic product per capita. This is so because economic globalisation enhances the rapidly increasing use of information in all forms of productive activities, therefore, the share of GDP per capita increases. Some studies have reported a positive relationship between economic globalisation and growth of gross domestic product (Asongu & Nwachukwu, 2017; Olimpia & Stela, 2017; Hammudeh et al., 2020).

The relationship between entrepreneurship and the dependent variable (GDPPC) is expected to be positive ($\alpha_2 > 0$). The justification for nexus between GDP per capita and entrepreneurship include; structural transformation, higher productivity, greater employment, introduction of new ideas, increased competition, and macroeconomic stability which extended to improve gross domestic product per person in a positive direction (Agbalajobi et al., 2018). The relationship between inflation rate and gross domestic product per capita is expected be negative ($\alpha_3 > 0$). Inflation affects how quickly the economy is growing. It erodes the value of money and worsens the standard of living (Nwafor, 2018).

The relationship between governance quality and gross domestic per capita is expected to be positive ($\alpha_4 > 0$). The quality of governance has it direct impact on political stability and corruption eradication. Therefore, allowing for functionality of the macroeconomic components through prudent fiscal and monetary measures toward the achievement of the growth objective. Further, the relationship between African infrastructure development index (AIDI) and gross domestic per capita is expected to be positive ($\alpha_5 > 0$). Infrastructural development is one of the engines that drive growth in the economy. Thus, increase in the infrastructure spending will stimulates productive activities leading to growth. Furthermore, the relationship between Oil Price (OilP) and gross domestic per person employed is expected to be positive ($\alpha_6 > 0$). Oil

exporting countries seems to have similar economic trends as their economies are been high influence by oil price shock from the international market. Hence, when oil price rises their economies benefit more. Therefore, it is expected that increase in oil price will increase economic growth of oil exporting countries.

3.3 Data and Sources of Data

The study makes use of yearly data from 2006 until 2021. The dependent variable is the gross domestic product per capital, the statistic was taken from the World Development Indicators (WDI) publications. Entrepreneurship and economic globalization are the independent variables. The World Bank Entrepreneurship Database is used as a proxy for entrepreneurship, whereas the KOF Globalization Index is used as a proxy for economic globalization. The total infrastructure quality index from African Infrastructure Development is one of the equations control variables. The total infrastructure quality index from African Infrastructure Development is one of the equations' control variables. To reduce infrastructural disparities between the nations, the variable was transformed to a natural log. According to the literature, an economy's level of infrastructure determines its capacity for inclusive growth (Mutiri et al., 2020). The International Energy Agency provided the oil price. As the study considers countries that export oil from Africa, the price of oil is also factored into the model. The West Texas Intermediate (WTI) crude oil spot prices, which are gathered from the International Energy Agency, are used to reflect the statistics on the price of crude oil.

Inflation is used as a proxy for macroeconomic stability as a control variable. The standard of living declines as inflation rises (Munemo, 2018; Nica, 2020; Mutiri et al., 2020). The World Development Indicators provide data on inflation. We also take governance quality into account, which is a significant variable that can affect inclusive African growth. It assesses the effectiveness of governance in terms of voice, accountability, rule of law, and regulatory quality (Mutiri et al., 2020). Six governance components—voice and accountability, political stability and lack of violence, government effectiveness, regulatory quality, rule of law, and control of corruption—were used to measure the composite governance quality using principal component analysis. These indicators were taken from the Worldwide Governance Indicators (World Bank, 2020). The principal component analysis was used to reduce large set of variables to a small set that still contains most of the information in the large data set. In addition, the PCA helps in simplifying the complexity in high-dimensional data and retains trends and patterns, thus the rational for using the approach to generate the governance quality

variable. Sixteen (16) African oil exporting nations were chosen based on the number of barrels of oil produced each day and the availability of data. The nations are Equatorial Guinea, Gabon, Ghana, Libya, Nigeria, South

Africa, Sudan, Tunisia, and Uganda. Algeria, Angola, Chad, Cameroon, Congo-Brazzaville, Cote d'Ivoire, Egypt, are also included. Table 1 provides an overview of the definitions of the variables utilized in this investigation.

Table 1: Definitions and Sources of Variables

Variables	Notation	Description	Sources
Dependent Variables			
Gross Domestic Product per capita	GDPPC	GDP per capita is a measurement of the GDP per person in a country's population. The natural logarithm of GDP per capita.	World Development Indicators
Independent Variables			
Entrepreneurship	ENTRE	New Business Density (new registration per 1,000 people ages 15-64)	World Bank Entrepreneurship Survey
Economic Globalization	ECOG	Economic globalisation Index	KOF globalisation index
Governance Quality	GQ	This is measured with the help of principal component analysis. We employ the six governance components: Voice and Accountability (VOA), Political Stability and Absence of Violence (POS), Government Effectiveness (GOE), Regulatory Quality (REQ), Rule of Law (ROL), and Control or Corruption (COR) to arrive at an index called the Governance quality.	Worldwide Governance Indicators
Inflation	INF	Inflation rate, CPI	World Bank Development Indicators
Aggregate Infrastructure Index	AIDI	African Infrastructure Development Index (consists of ICT, Transport, Electricity, Water and Sanitation indicators). The natural logarithm of Aggregate infrastructure was used.	African Infrastructure Development Index
Oil Price	OILP	West Texas Intermediate (WTI) crude oil spot prices	International Energy Agency

Source: Author's Compilation

3.4 Estimation Methods

The following estimation strategies were adopted to achieve the central objective of the study. First, due to the nature of the data which is from different countries, the panel data cross-sectional dependence test was conducted and there is overwhelming evidence of cross-sectional dependence amongst the selected countries. This led to the second stage which is the panel unit root that accounts for cross-sectional dependence. Because of the presence of cross-sectional dependence, the study used both the first-generation panel unit root tests, such as the Levin, Lin, and Chu (LLC) and Im, Pesaran, and Shin W-stat (IPS) tests, and second-generation panel unit root tests, specifically the cross-sectional dependence version of the Im-Pesaran-Shin W-stat (CIPS). The LLC is based on the common unit root process, whereas the panel unit root test of the data through the IPS is based

on the individual unit root process. The third stage examined the possibility of slope homogeneity test, and the results showed that there is presence of heterogeneity amongst the selected oil exporting African countries, which further confirms the choice of a dynamic heterogeneous panel models. The fourth stage is the test of the research hypothesis using dynamic heterogenous panel models. In this case, the Mean Group (MG); Pooled Mean Group (PMG), and Dynamic Fixed Effect (DFE) estimators were developed for dynamic heterogeneous panel data analysis (Pesaran and Smith, 1995; Pesaran et al. 1999) were used. The Hausman test is used to select the appropriate model. The fifth stage is a sensitivity analysis using the augmented mean group due to the presence of cross-sectional dependence and the AMG confirms the results of the dynamic heterogenous panel modes of PMG, MG, and DFE.

4. Results and Interpretation

4.1.1 Descriptive Statistics

This section of the study provides insights into the economic globalization, entrepreneurship and inclusive growth in selected oil exporting African countries. The variables of interest are; dependent variable is GDP per

capita (GDPPC). The explanatory variables are; Economic Globalization (ECOG), Entrepreneurship (ENTRE), Aggregate Infrastructure Development Index (AIDI), Inflation rate (INF), Oil Price (OILP) and Governance Quality (GQ). The analysis is carried out by estimating the means, minimum, maximum, and standard deviations of each of the proxies.

Table 2: Descriptive Statistics for Economic Globalization, Entrepreneurship and Inclusive Growth

Variables	Mean	Maximum	Minimum	Std. Dev.	Obs.
GDPPC	3920.194	16438.640	604.987	3360.124	256
ECOG	44.586	62.928	29.203	8.644	256
ENTRE	4.848	39.040	0.280	5.811	256
INF	9.252	32.816	8.975	26.318	256
AIDI	30.585	88.738	3.211	23.655	256
OILP	76.711	113.760	41.890	33.065	256
GQ	0.053	3.152	-1.319	0.996	256

Source: Researcher's Computation (2023).

Table 2 reports the mean, maximum, minimum values and the standard deviation for GDP per capita (GDPPC), Economic Globalization (ECOG), Entrepreneurship (ENTRE), Aggregate Infrastructure Development Index (AIDI), Inflation rate (INF), Oil Price (OILP) and Governance Quality (GQ).

The mean value for the GDPPC is 3920.19 dollars with a standard deviation of 3360.12 dollars. The mean value suggests that amongst the selected countries the income per individual is around 3920.19 dollars per year and this is pretty low considering that these countries earn oil revenue. The standard deviation is also relatively high, this further explained that the GDP per capita is highly likely to change over time. The minimum and maximum also differs this suggest that the amount of income earning per individual in the selected countries are the same. The mean value of ECOG is 44.586 and the standard deviation has an estimated value of 8.644. The standard deviation suggests that it is far away from the mean and it implies that that is less susceptible to change amongst the selected countries. The minimum value of 29.20 and maximum value of 62.93 also explained that the degree of economic globalization amongst the selected countries are not the same. The new business density has an estimated mean of 4.848 and the standard deviation is estimated at 5.811 which is not far from the mean. This suggests that the level of entrepreneurship in the selected countries is very low. The minimum value is 0.280 and the maximum value is 39.490 which further suggests that the level of entrepreneurship activities differs amongst the selected countries.

The INF has an estimated mean of 9.252 and a standard deviation of 26.32. The results showed that the standard deviation is far away from the mean, the implication of this is that the continuous increase in prices of goods and services differs amongst the selected countries. The minimum value is 8.975 and the maximum value of 26.32

further suggests while some countries have a single digit inflation other country had a double-digit inflation. The AIDI has an estimated mean value of 30.59 and a standard deviation of 23.66. The value of the standard deviation is not far away from the mean, this suggests that the level of infrastructure development among the selected oil exporting countries is less likely to change. The minimum value of 3.21 and maximum value of 88.74 also suggests that the level of infrastructure development index of the selected oil exporting African countries are not the same.

The OILP has an estimated mean of 76.711 dollars per barrel and a standard deviation of 33.06 per barrel. This further suggests that oil price across the world are volatile and are highly susceptible to change due to its demand and supply and other external shocks. The minimum value of 41.89 and maximum value of 113.76 dollars per barrel, further suggests the revenue profiles of these countries are more likely to increase or decrease at the slightest global shocks. The GQ has an estimated mean of 0.053 and a standard deviation of 0.996, indicating a low degree of variation in governance quality amongst the selected oil exporting African countries. The minimum value of -1.319 suggests that some countries have poor governance quality, while the maximum value of 3.14 indicates that some countries have better governance quality. The implication of this result also suggests the measures of governance quality of voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control or corruption are still very low.

Due to the study focus, group statistics for all the series differs, while for all series there are positive values on the average. The differences in the values of the selected countries is not unconnected to fluctuations in oil prices and low domestic resources mobilization. This further suggests the heterogeneous nature of the selected countries thereby supporting the rationale for heterogeneous analysis.

4.1.2 Correlation Analysis and Variance Inflation Factor (VIF)

This section discusses the degree of association between the variables of interest of the study. The correlation between logarithms of GDP per capita (GDPPC), with Economic Globalization (ECOG), Entrepreneurship (ENTRE), Aggregate Infrastructure Development Index (LAIDI), Inflation rate (INF), Oil Price (OILP) and Governance Quality (GQ) for the period 2006-2021 for 16 oil exporting countries in Africa. The main aims of this analysis are to examine the potential relationship among these variables and investigate if there is any association that can potentially cause multicollinearity in the data. In order to strengthen the level of the potential multicollinearity check, the variance inflation factor (VIF) test is also carried out and the results are presented in this section.

Interpretation

Starting with the statistical interpretation, the result in Table 3 shows that most of the estimated correlations coefficients were low, with absolute values below 0.3.

Table 3: Correlation Matrix for Economic Globalization, Entrepreneurship and GDP per Capita

Variables	LGDPPC	ECOG	ENTRE	INF	LAIDI	OILP	GQ	VIF
LGDPPC	1.000							N/A
ECOG	0.662	1.000						1.17
ENTRE	-0.322	-0.129	1.000					1.26
INF	-0.071	0.021	0.137	1.000				1.03
LAIDI	0.603	0.338	-0.428	-0.049	1.000			1.94
OILP	0.017	0.065	-0.025	-0.033	-0.119	1.000		1.04
GQ	0.218	0.323	-0.303	-0.076	0.625	-0.035	1.000	1.69

Source: Researcher's Computation 2023.

Notes: Table 3 shows the Pearson pairwise correlation matrix.

The dependent variable is natural log of GDP per capita (LGDPPC). The explanatory variables are; Economic Globalization (ECOG), Entrepreneurship (ENTRE), Natural logarithm of Aggregate Infrastructure Index (LAIDI), Inflation rate (INF), Oil Price (OILP) and Governance Quality (GQ) for the period 2006-2021 for 16 selected oil exporting countries in Africa representing 256 yearly observations. The estimation process was facilitated using Eviews 12. The correlations are below the

Only a few correlations were moderately strong, with absolute values between 0.3 and 0.6. Overall, given the absolute values which were not above 0.6, it is pertinent to mention that no high correlation is observed in this study.

Furthermore, some interesting patterns were observed in the correlation matrix. In addition, there is evidence that economic globalization, aggregate infrastructure development index, oil price and governance quality have positive association with the GDP per capita with values between 0.017 to 0.662, while entrepreneurship and inflation have negative association with the GDP per capita.

In conclusion, the correlation analysis provides some interesting insights into the relationships among the variables particularly the explanatory variable. It can be deduced that all the explanatory variables' correlations were low, suggesting that the variables were not strongly associated to the point of causing multicollinearity problem in the subsequent analyses.

Moving to variance inflation factor (VIF), the results of the variance inflation factor which measures the degree of correlation amongst the regressors showed that the VIF is less than 10. The VIF were 1.17, 1.26, 1.03, 1.94, 1.04 and 1.69 for economic globalization, entrepreneurship, inflation, aggregate infrastructure development index, oil price, and governance quality. This suggests that the explanatory variables are not correlated, thus, there is no problem of multicollinearity amongst the regressors included in the models.

major diagonal and the last row titled VIF is the test for multicollinearity.

4.1.3 Cross-Sectional Dependence Test Results

Prior to examining the panel data unit root, it is customary to test for cross-sectional dependence amongst the cross-sectional units included in the study. Specifically, three (3) cross-sectional dependence tests are conducted, as shown in Table 4. The null hypothesis of cross-sectional

independence is rejected for all the tests in the GDP per capita equation, thus accepting the alternative hypothesis of cross-sectional dependence among the selected oil-exporting countries in Africa. This suggests that the macroeconomic challenges encountered in these countries can be traced and linked to their similar global oil price exposure cum economic conditions. Based on this presence of cross-sectional dependence amongst the

selected oil exporting countries, it is pertinent to conduct both the first generation and second-generation. It should be noted that the second-generation unit roots tests of Cross-Sectional Augmented IPS (CIPS) which account for cross-sectional dependence were conducted and this is reported in Table 5 alongside with the Levin, Lin, and Chu (LLC) and the Im, Pesaran, and Shin (IPS) first generation panel unit root tests.

Table 4: Panel Data Cross-Sectional Dependence Test GDP per Capita Equation

Breusch-Pagan LM	466.11***	0.000
Pesaran scaled LM	22.341***	0.000
Pesaran CD	7.755***	0.000

Note: *** and ** indicate significance at the 1% and 5% levels, respectively.

4.1.4 Panel Data Unit Root Test

First, two categories of panel data unit root tests are employed: first generation (panel data unit root test without cross-sectional dependence) and second-generation (with cross-sectional dependence) tests. Table 5 presents the results. From the table, most of the series become stationary in their first differences using the first-generation tests (LLC and IPS) except economic globalization and inflation which were stationary at levels. The second-generation panel unit root test of (CIPS) which accounting for cross-sectional dependence

showed that all the series were stationary after 1st differences except the inflation rate which is stationary at levels. However, because the variables have different order of integration it is necessary to use dynamic heterogenous panel of Pooled Mean Group (PMG), Mean Group (MG), and Dynamic Fixed Effect (DFE) to test the hypotheses of the study. In addition, a sensitivity analysis was also used to ascertain the results of each model using the Augmented Mean Group (AMG) that accounts for autocorrelation, heteroscedasticity and cross-sectional dependence.

Table 5: 1st and 2nd Generation Panel Data Unit Root Test Results

Variables	LLC	IPS	CIPS	Variables	LLC	IPS	CIPS	Remarks
LGDPCC	-1.112	1.732	-1.784	ΔLGDPCC	-5.229***	-5.238***	-2.775***	I(1)
ECOG	-5.232***	-3.399***	-2.180	ΔECOG	-8.925***	-7.569***	-4.146***	I(0)
ENTRE	-1.521	-1.170	-1.791	ΔENTRE	-7.675***	-6.939***	-3.758***	I(1)
INF	-4.519***	-3.336***	-2.723***	ΔINF	-14.724***	-6.503***	-3.843***	I(0)
LAIID	-1.569	-0.553	-1.377	ΔLAIID	-3.224***	-5.017***	-3.845***	I(1)
OILP	-1.410	-1.657	-1.721	ΔOILP	-8.826***	-6.484***	-2.610***	I(1)
GQ	-1.889	-1.133	-2.074	ΔGQ	-7.089***	-8.301***	-4.560***	I(1)

Notes: The panel unit root test without cross-sectional dependence are the Levin, Lin, and Chu (LLC) and the Im, Pesaran, and Shin, while the panel unit root test with cross-sectional dependence is the CIPS. In addition, *** and ** indicate 1% and 5% respectively and the respective critical values are CIPS -2.45 and -2.22, IPS = -2.02 and -1.87 and LLC = -3.10 and 3.10 at 1% and 5% respectively.

4.1.5 Homogeneity Test

Testing for heterogeneity in the slope is one of the conventions of the dynamic heterogeneous panel-ARDL model. Using the Blomquist and Westerlund (2013) homogeneity test results from Table 6, for the GDP per capita equation and the null hypothesis of homogeneous slope coefficients is strongly rejected, in favour of the

alternative hypothesis of heterogenous slope coefficients, thus, there is presence of heterogeneity amongst the selected oil exporting countries in Africa. This is because the Blomquist and Westerlund (2013) homogeneity test statistic is statistically significant at 1 per cent level, this further confirms the choice of the dynamic heterogeneous panel models.

4.2 Results

4.2.1 Hypothesis Testing

This section presents the results of the study by testing the hypotheses using dynamic heterogeneous panel of PMG, MG, and DFE, as well as sensitivity analysis using the Augmented Mean Group (AMG) that accounts for serial correlation, heteroscedasticity and cross-sectional dependence.

Research Hypothesis: Economic globalization and entrepreneurship have no significant effect on GDP per capita in Africa oil exporting countries.

Table 6: Blomquist and Westerlund (2013) homogeneity test

GDP per Capita Equation		
Δ	4.016***	0.000
Δ adj	6.349***	0.000

*** represents a 1% level of significance

Table 7: Economic Globalization, Entrepreneurship, and GDP Per Capita

Dependent Variable: LGDPPC

Variables	PMG	MG	DFE	AMG
Long-Run Estimates				
ECOG	4.337*** (4.627)	3.072** (2.468)	0.486 (1.225)	0.307*** (3.543)
ENTRE	0.245 (1.435)	1.155 (1.040)	0.000 (0.068)	0.040 (0.809)
INF	0.064 (1.443)	-0.042 (-1.039)	-0.003 [†] (-1.755)	-0.002 (-1.481)
LAIDI	2.260*** (4.231)	0.360 (0.349)	0.296*** (2.642)	0.409*** (3.391)
OILP	-0.462 (-1.085)	-0.091 (-0.618)	-0.026 (-0.250)	0.034 (1.138)
GQ	-0.342 (-1.378)	-0.205 (-1.274)	-0.021 (-0.636)	0.000 (0.009)
RMSE				0.016
Constant				4.018*** (7.038)
Short-Run Estimates				
ECT	-0.224** (-2.458)	-0.196 (-0.348)	-0.230*** (-5.698)	
D.ECOG	-0.036 (-0.358)	1.045 (1.472)	-0.017 (-0.160)	
D.ENTRE	0.002 (0.071)	0.085 (1.552)	-0.000 (-0.121)	
D.INF	-0.001 (-0.789)	-0.015 (-1.168)	-0.001 [†] (-1.886)	
D.LAIDI	0.179 (1.491)	-0.141 (-1.193)	-0.046 (-0.339)	
D.OILP	0.040 [†] (1.661)	0.079 (1.133)	0.034 [†] (1.736)	
D.GQ	-0.016 (-1.532)	-0.177 (-0.880)	-0.001 (-0.136)	
Constant	0.132** (2.240)	4.306 (0.865)	-0.532*** (-2.619)	
MG vs PMG	0.88 (0.989)	-	-	-
PMG vs DFE	0.000 (1.000)	-	-	-
Wald Test	-	-	-	18.32 (0.006)
Observations	256	256	256	256

Notes: ***, ** and * indicate 1%, 5% and 10% levels of significance respectively. The *t* statistics in parentheses

Interpretation of Results

From Table 7, the Hausman test is employed to determine the most appropriate model among the three

dynamic heterogeneous models: PMG, MG, and DFE. It is revealed from the Hausman test that the PMG is the most preferred model. First, the Hausman test was used to know the appropriate model between the PMG and the MG, the Hausman statistic of 0.88 was statistically insignificant at 5 percent level, thus, the study fails to reject the null of PMG and rejects the alternative hypothesis of MG. Second, the Hausman test was also conducted to the appropriate model between the PMG and the DFE, the Hausman statistic of 0.000 was statistically insignificant at 5 percent level, thus, the study fails to reject the null of PMG and rejects the alternative hypothesis of DFE. Thus, discussion of results is based on the PMG and it offers some interesting results.

In the long run, there is evidence that economic globalization has a positive relationship with GDP per capita. This implies that increases in the economic globalization will lead to increase in GDP per capita. Thus, 1 per cent increase in economic globalization will lead to 4.337 per cent increase in GDP per capita. The results also revealed that the economic globalization has significant relationship with the GDP per capita of the selected oil exporting African countries (ECOG = 4.337, Z-test= 4.627, $p < 0.05$). This implies that economic globalization is a significant factor influencing changes in GDP per capita of the selected oil exporting African countries.

The results also show that entrepreneurship has a positive relationship with GDP per capita. This implies that increases in the entrepreneurship will lead to increase in GDP per capita. Thus, 1 per cent increase in entrepreneurship will lead to 0.245 per cent increase in GDP per capita. The results revealed that the entrepreneurship has no significant relationship with the GDP per capita of the selected oil exporting African countries (ENTRE = 0.245, Z-test= 1.435, $p > 0.05$). This implies that entrepreneurship is not a significant factor influencing changes in GDP per capita of the selected oil exporting African countries.

Furthermore, there is evidence that inflation has a positive relationship with GDP per capita. This implies that increases in the inflation will lead to increase in GDP per capita. Thus, 1 per cent increase in inflation will lead to 0.064 per cent increase in GDP per capita. The results revealed that the inflation has no significant relationship with the GDP per capita of the selected oil exporting African countries (INF = 0.064, Z-test= 1.443, $p > 0.05$). This implies that inflation is a not significant factor influencing changes in GDP per capita of the selected oil exporting African countries.

In addition, there is evidence that aggregate infrastructure index has a positive relationship with GDP per capita. This implies that increases in the aggregate

infrastructure index will lead to increase in GDP per capita. Thus, 1 per cent increase in aggregate infrastructure index will lead to 2.260 per cent increase in GDP per capita. The results revealed that the aggregate infrastructure index has significant relationship with the GDP per capita of the selected oil exporting African countries (LAIDI = 2.260, Z-test= 4.231, $p < 0.05$). This implies that aggregate infrastructure index is a significant factor influencing changes in GDP per capita of the selected oil exporting African countries.

Conversely, there is evidence that oil price has a negative relationship with GDP per capita. This implies that increases in the oil price will lead to decrease in GDP per capita. Thus, 1 per cent increase in oil price will lead to 0.462 per cent decrease in GDP per capita. The results revealed that the oil price has no significant relationship with the GDP per capita of the selected oil exporting African countries (OILP = -0.462, Z-test= -1.085, $p > 0.05$). This implies that oil price is not a significant factor influencing changes in GDP per capita of the selected oil exporting African countries.

In addition, there is evidence that governance quality has a negative relationship with GDP per capita. This implies that increases in the governance quality will lead to fall in the GDP per capita. Thus, 1 per cent increase in governance quality will lead to 0.342 per cent decrease in GDP per capita. The results revealed that the governance quality has no significant relationship with the GDP per capita of the selected oil exporting African countries (GQ = -0.342, Z-test= -1.378, $p > 0.05$). This implies that governance quality is not a significant factor influencing changes in GDP per capita of the selected oil exporting African countries.

The results from the short-run shows that the cointegrating term is found to have the right sign and it is significant as expected implying that any deviation from the steady-state is easily corrected for the oil-exporting African countries. Thus, the error correction term of -0.224, with a Z-statistic value of -2.458 is statistically significant and that it takes the adjustment process back to equilibrium is around 22 percent within a year. The purpose of the short-run coefficients is also to determine if the results in the long-run will be in conformity with the short run in terms of significance and the signs. The results show that in the short run, economic globalization has a negative and insignificant relationship with the GDP per capita in the selected African oil exporting countries. This results in at variance with the long-run estimates, thus, in the short run economic globalization is not a significant factor influencing changes in the GDP per capita.

Next is the level of entrepreneurship in the selected listed African oil exporting countries, the results revealed that in the short run, entrepreneurship has a positive and insignificant relationship with the GDP per capita. This result is in conformity with the results reported in the long-run which is positive but insignificant. The implication of this result is that entrepreneurship proxy with new registration of business entity does not impact on GDP per capita in the short and thus, it takes a longer period to have a positive and significant impact on the GDP per capita owing to lack of adequate infrastructure and problem of insecurity that pervades majority of the selected oil exporting African countries.

The coefficient of inflation is negative and statistically insignificant in the short run, this suggest that inflation impairs GDP per capita, while it has a positive but insignificant impact with the GDP per person in the long-run. In addition, the aggregate infrastructure index has a positive but insignificant impact in the short, whereas in the long-run it is positive and significant, this implies that investment in infrastructure in the selected African countries has recognition and implementation lag before it can engender growth in the GDP per capita.

The coefficient of oil price is positive and statistically insignificant in the short run, thus is in consonance with the results reported in the long-run. Thus, in the selected Africa oil-exporting countries rising international price of oil is not a significant factor influencing changes in GDP per capita in these countries. The result also indicates the importance of oil price shocks, originating from the external sector, in determining the level of inclusivity of these countries. In addition, there is evidence that governance quality is negative and statistically insignificant in the short-run, this result is in conformity with the results reported in the long-run. This further suggests that the level of adherence to institutional quality is still very low and it negatively affects growth in the selected oil exporting African countries.

4.2.2 Sensitivity Analysis

In an attempt to confirm the results of MG, the [Eberhardt and Bond \(2009\)](#) developed AMG is also used for robustness check and sensitivity analysis. The AMG also produces reliable and consistent results when there is cross-sectional dependence. The result in the last column of Table 7 further confirms that economic globalization and aggregate infrastructure index have positive and significant relationship with the GDP per capita for the selected countries. In addition, there is evidence of entrepreneurship positively influenced the GDP per capita although it was found insignificant.

The model's overall fit is indicated by the Wald test, which tests the null hypothesis that all coefficients in the model are zero. In this case, the Wald test is significant at the 1% level, indicating that the model as a whole is a good fit for the data. Alternatively, the Wald test statistic of 18.32 with a probability value of 0.000 implies that economic globalization, entrepreneurship activities, inflation, aggregate infrastructure index, oil price, and governance quality are joint significant factors influencing changes in GDP per capita of the selected oil exporting African countries.

At 5 % level of significance, and degree of freedom of 6, 249, the Wald Chi Square Statistic of 18.32 is statistically significant at 0.05 level, this implies that the null that there is no significant effect of economic globalization and entrepreneurship on GDP per capita in Africa oil exporting countries was rejected and that the alternative hypothesis that there is significant effect of economic globalization and entrepreneurship on GDP per capita in Africa oil exporting countries was accepted.

4.2.3 Discussion of Findings

The study examined the impact of economic globalization, entrepreneurship, and GDP per capita amongst selected oil exporting African countries, and the results revealed that there is evidence that economic globalization has a positive relationship with GDP per capita. The results also show that entrepreneurship has a positive relationship with GDP per capita. This implies that increases in the entrepreneurship will lead to increase in GDP per capita. Thus, 1 per cent increase in entrepreneurship will lead to 0.245 per cent increase in GDP per capita. Studies in conformity with the outcome of this study are [Carree et al. \(2007\)](#) utilizing information from 23 OECD nations between 1972 and 2004. [Audretsch et al. \(2006\)](#) empirically demonstrate the presence of a link between entrepreneurship and GDP per capita supporting the findings of [Carree et al. \(2007\)](#). Other studies also in conformity with the results of this study is [Wong et al. \(2005\)](#) who draw the conclusion that entrepreneurship has a favourable impact on GDP per capita growth for a sample of 37 nations. [Raooft et al. \(2014\)](#) who examined the connection between entrepreneurship and economic growth and development. The authors discovered that in those nations, entrepreneurship positively and strongly predicts economic growth and development.

In addition, [Acs et al. \(2013\)](#) empirically examines and analysed the significance of entrepreneurship in economic growth using data for 18 countries. The study's findings suggest that knowledge-based entrepreneurship makes a substantial contribution to encouraging economic growth. The writers make the point that entrepreneurship is a mechanism that makes

it easier for information to spread, which promotes economic expansion.

5. Conclusion and Recommendation

The study examined the impact of economic globalization, entrepreneurship and GDP per capita of oil exporting African countries. The results revealed that in the long run, there is evidence that economic globalization and aggregate infrastructure development index have positive and significant relationship with GDP per capita. This implies that economic globalization and aggregate infrastructure development index were significant factors influencing changes in GDP per capita of the selected oil exporting African countries. The results also show that entrepreneurship, inflation rate have positive and insignificant relationship with GDP per capita. This implies that entrepreneurship and inflation rate were not significant factors influencing changes in

GDP per capita of the selected oil exporting African countries. Conversely, there is evidence that oil price and governance quality have negative and insignificant relationship with GDP per capita. Thus, oil price and governance quality were not significant factors influencing changes in GDP per capita of the selected oil exporting African countries. Using the dynamic heterogenous panel of Pooled Mean Group (PMG) regression to test the hypothesis, the study found that economic globalization and entrepreneurship had significant effects on GDP per person employed in Africa oil exporting countries. The study therefore concluded that economic globalization and entrepreneurship are significant factors influencing GDP per capita in Africa oil exporting countries. The study recommends that oil exporting African countries policy makers should change their centrally planned economies and hand more responsibility over to private sector players, with the government performing regulatory roles.

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