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Nexus between Trade integration and Economic Growth: Case of Sub-Saharan Africa (SSA) Countries: An Application of the Feasible Generalized Least Square (FGLS) Panel Data Approach

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Abstract:
Issues: The relationship between trade integration and economic growth has been thoroughly researched, but the conclusions have been uneven and unsatisfying. The study focusing on the argument over the impact of trade integration on economic growth is thus still unclear **Methods:** This study looks at the impact of trade integration on economic growth in Sub-Saharan African countries from 1995 to 2018. **Findings:** The FGLS result shows that Wald Chi2 =**2839.02** is equally high and statistically significant Pvalue =0.0000***. As a result, the overall model is satisfactory. Labor productivity and health capital have a good and considerable impact on SSA countries' economic performance. Trade integration, population growth rate, gross capital formation, and financial development are not only substantial but also have a beneficial impact on SSA nations' real GDP per capita. Foreign aid, on the other hand, undermines it. Foreign Direct Investment has a negligible positive influence on per capita real GDP. **Conclusions:** To fully benefit from global trade integration, SSA countries must first improve their trade balance through export diversification and balanced growth. Second, in order to effectively engage in regional and global value chains, SSA countries must improve their internal infrastructure.

Keywords: 1. Trade Integration 2. Economic Growth 3. FGLS

1. Introduction

Economic growth is a method of improving an economy's productive potential over time, resulting in higher levels of national production and income (Todaro, 2005). Rapid economic growth and sustainable development are the macroeconomic aspirations of developing countries. In order to achieve deeper integration into the global economy and acceptable economic results, an increasing number of developing countries have pursued trade reforms in recent years.

The SSA economy has been assigned to gradually integrate into the globalization game through an economic policy of opening to the outside world. The value of free trade cannot be overstated. According to Kray (2012) trade has a well-known effect on increasing competitiveness and improving efficiency. As a result, trade integration is expected to be a driving force in economic growth, with governments liberalizing imports and shifting output toward exports expected to grow faster than countries that do not, and a faster rate of opening provides greater development opportunities.

However, the influence of trade integration on economic growth has been contested both conceptually and experimentally. Trade integration, according to traditional trade theories, can boost economic growth by increasing access to goods and services, achieving resource allocation efficiency through comparative advantage, creating job opportunities, and generating capital, all of which lead to higher GDP per capita living standards. Grossman and Helpman (1991); Harrison (1996); Chen Bajwa and Siddiqui (2011).

Furthermore, trade integration, according to Vutha (2013); (2008), might increase economic growth. The first is to allocate resources more efficiently. Resources are pushed towards a more efficient production system, resulting in better resource allocations, according to absolute advantage. Economies of scale are the next factor to consider. Trade increases a firm's innovativeness, allowing it to extend its exports as well as its home market, so increasing overall economic productivity. Third, they claimed that technology spillovers from industrialized to developing nations are significant, and that trade is an important avenue for spillover. Finally, investment incentives; permitting free movement of Foreign Direct Investment (FDI) improves technology and innovation, resulting in more efficient production and worldwide competition. Data supports the conclusion that trade integration promotes economic growth. Asfaw (2014); Muhammad and Toseef (2015); Freund and Bolkay (2008); Chang et al (2009). They said that international trade integration serves as a conduit for FDI, capital inputs, products, and services to flow into host countries or regions.

Another widely held belief was that industrialized countries have control over raw material costs due to their strong bargaining position with transnational corporations. Because of a shift from light to heavy industries in developed countries, a rise in the share of services in total output in developing countries, the application of the Engel law, Agricultural

Protectionism by developed countries, and increased use of synthetics and manmade inputs, the authors argue that the benefits of international trade have been reduced.
Others contend that when trading partners are asymmetric countries with considerably different technology and endowments, economic integration, while increasing global development rates, may have unfavorable effects on developing countries .Certainly, empirical evidence has shown in favor of trade openness having a negative impact on economic growth Chantal et al, (2011); Ulsan 2015; Mputu2016; Coke 2010; Samimi and Nademi (2012).

2. Literature Review

This section provides brief summary of reviewed literatures in view of the nexus between trade integration and economic growth with particular focus on SSA economy.
According to Mathew and Adegye (2014) trade integration has positive impact for those countries who are exporting goods and services that those who are importing goods and services. The study was made using panel data analysis using GMM approaches. Emphasis was given for role of institutions in fostering exports and thereby economic growth.
Using the dominant variables: Inflation, financial development, human capital investment and institutional quality Zahanogo (2017) examined the effect of trade integration on economic performances in SSA using the Pooled mean group (PMG) estimations. Using the inverted trade curve, the result of the study confirmed that trade integration augmented with favorable homemade policies enhances economic growth in the long run though not in the short run.
Study made by Keho (2017) a country level study, for Cote D'Ivoire, to analyze the effect of trade openness on economic growth using time series approach. The result of the study shows that trade openness has positive impact both on economic growth and capital formation of the country both in the short run and long run.
On the contrary, Olasade et al (2015), Musila and Yiheyis (2015) analyzed the effect of trade on economic growth and come up with negative results.
Thus, from the above empirical results, one can figure out that different studies came up with different suggestions and outcomes. Further, methodologically and in terms of variables used to examine the nexus between trade integration and economic growth the current study opted to analyze the issue using the sophisticated panel data approaches of FGLS and GMM together with inclusion of new variables and broader time periods.

3. Objective of the study

The main objective of this study is to examine the nexus between trade integration and economic growth in SSA from 1995 to 2018.

4. Methods of the study

The following are variables included for analysis of the study

Table 1 : **List of Variables**

List of Variables	Description
Dependent Variable	
GDP per capita	Base year=2010 at constant USD price
Independent variables	
Trade Integration (TI)	Ratio of the sum of Export and Import as % of GDP
Foreign Direct Investment (FDI)	Foreign direct investment, net inflows (% of GDP)
Real Capital (GCF)	Real capital and domestic investment is proxied by Gross capital formation (constant at 2010 US$)
Labour Force (LF)	Labour force is proxied population growth rate
Financial Deepening[1] (FDEV)	Ratio of domestic credit to private sector as %GDP
Foreign Aid (AID)	Net ODA received as % of GNI

Source: WB &WDI (2021)

We can express the logarithmic transformed growth equation in an explicit empirical model as follows after adding the stochastic component of RGDP per capita to equation:

$$\ln RGDP\_PC_{it} = \beta_0 + \beta_1 \ln GCF_{it} + \beta_2 \ln LF_{it} + \beta_3 \ln TI_{it} + \beta_4 FDI_{it} + \beta_5 FDEP_{it} + \beta_6 FAID + \beta_7 INF_{it} + ai + a_t + u_{it} \quad ----------(4)$$

Where, $RGDP\_PC_{it}$ is real gross domestic product per capita of country *i* and year *t*; GCF_{it} is Gross capital formation (as a proxy for real capital); LF_{it} a measure for population growth rate; TI_{it} measures openness (as a ratio of total trade to real GDP); FDI_{it}Foreign Direct Investment; $FDEP_{it}$ is a measure of financial development (ratio of domestic credit to private sector); $FAID_{it}$ is a Foreign Aid, a_i is country specific effects; a_t is time fixed effects; $\beta_i$represent the elasticity coefficients and u_{it} is the disturbance term and assumed to be identically and independently distributed (IID).

The panel data properties of the data were examined in the study. These are panel unit root tests performed in three different ways. Im, Pesaran, and Shin (2003); Levin, Lin, and

[1] Financial development can also be measured by the ratio of broad money (M2) to GDP and considered to be a standard measure by many literatures however, these ratio measures the extent of monetarization rather than financial development (Khan, M. A., Qayyum, A., 2006). The ratio of domestic credit to private sector excludes the public sector and therefore reflects more efficient resource allocation in the economy since private sector is able to utilize funds in more efficient and productive manner as compared to the public sector and it represents an accurate indicator (proxy) of the functioning of financial development because it is a measure of the quantity and quality of investment.

Chu (2002); and Breitung (2000) are examples where the null hypothesis states that the series has a unit root problem and the alternative hypothesis states that the series is stationary.

The panel cointegration test was used to examine long-run relationships between variables (dependent variable and set of explanatory variables). The Pedironi Panel cointegration test (Pedroni, 1999; 2004) and the Kao (1999) residual-based cointegration test were used in the test. Finally, the econometric results were analyzed using panel data regression models ranging from fixed effect models to feasible generalized least squares (FGLS).

5. **Data Used**

The on the variables used were collected from the World Bank- World Development Indicator (WB-WDI) Database for the year 1995 to 2018 to assess the nexus between trade integration and economic growth for SSA.

6. Data Analysis

This section thoroughly covers the estimation and discussion of results based on the stated econometric model to estimate the nexus between trade integration and economic growth and the different estimation approaches utilized throughout.

6.1 Descriptive Analysis

The table below displays summary statistics for variables included in estimated model in such a way that each row depicts summary statistics for the individual variables. As can be seen in the table below, GDP_PC has an overall average annual growth rate of roughly 7.09 percent, with an annual minimum growth rate of 5.23 percent and an annual maximum growth rate of 8.94 percent. The variation in GDP_PC within SSA African countries differs by roughly 1.03 percent from the overall average growth, indicating that there is no substantial difference.

Table 2: Summary Statistics

Variables	Mean	Std.Dev	Max	Min	
LRGD_PC	**7.09**	**1.03**	**8.94**	**5.23**	
LTI	**3.28**	**0.39**	**4.14**	**2.19**	
FDI	**2.75**	**2.04**	**10.70**	**-0.32**	
LGCF	**22.34**	**1.23**	**25.21**	**20.41**	
LF	**2.53**	**0.61**	**3.48**	**0.92**	
LFDEP	**2.86**	**0.75**	**4.36**	**0.48**	
LAID	**6.05**	**5.09**	**18.94**	**0.25**	

Source: Computation based on data of WB, 2021

The average share of trade integration in the second row is 3.28 percent, with the largest overall share of 4.14 percent and the smallest overall share of 2.19 percent. This sector's overall contribution differs from the overall average contribution by approximately 0.39 percent. Overall, the average FDI contribution is 2.75 percent, with a maximum contribution of 10.70 percent and a minimum negative contribution of -0.32 percent.

Furthermore, the GCF's overall average contribution is approximately 22.34 percent, with a maximum average of 25.21 percent and a minimum of 20.41 percent. Similarly, the labor force, financial deepening, and foreign aid all have average overall values of 2.53%, 2.86%, and 6.05%, respectively.

In addition, the corresponding variables given in sequence have an average maximum of 3.48 percent, 4.36 percent, and 19.94 percent, and an average minimum of 0.92 percent, 0.48 percent, and 0.25 percent.

6.2 Pairwise Correlation Analysis

Trade integration and GDP per capita have a 0.59 correlation coefficient. There is a strong and significant positive association between trade integration and per capita GDP, as the value is more than 0.5 and statistically significant (Pvalue = 0.000 is less than 1%). Similarly, with a correlation coefficient of 0.45, there is a considerable positive relationship between per capita GDP and gross capital formation (GCF).

Furthermore, a correlation coefficient of 0.60 indicates that financial deepening (FDEP) and per capita GDP have a substantial positive link. Furthermore, with correlation coefficients of 0.17 and 0.18, labor force and FDI have a positive relationship with per capita GDP. Foreign aid, on the other hand, has a negative relationship with per capita GDP.

Table 3: Pairwise Correlation Matrix

	LRGDP	LOPEN	LGCF	LFDEP	LF	FDI	FAID
LRGDP	1.0000						
LTI	**0.58**** (0.0000)	1.0000					
LGCF	**0.45**** (0.0000)	-0.078 (0.2382)	1.0000				
LFDEP	**0.60**** (0.0000)	**0.62**** (0.0000)	**0.30**** (0.0000)	1.0000			
LF	**0.17**** (0.0083)	-0.07 (0.3157)	-0.07 (0.2842)	0.0053 (0.9347)	1.0000		
FDI	**0.18*** (0.0061)	**0.2617*** (0.0000)	-0.0079 (0.9033)	-0.0078 (0.9040)	0.1117 (0.0842)	1.0000	
AID	**-0.77**** (0.0000)	**0.38**** (0.0000)	**0.52**** (0.0000)	**0.44**** (0.0000)	0.01 (0.8409)	-0.05 (0.4199)	1.0000

Notes: ** indicates the statistical significance at 5 %($**p<0.05$) and values in parenthesis shows p-values.

Source: **Computation based on data of WB, 2021**

6.3. Econometric Analysis

6.3.1 Panel Unit root test[2]

The regression results are usually preceded by appropriate unit root tests and the order of integration to be set. To determine if the data series is stationary or has a unit root, three forms of formal panel unit root tests are used. The unit root tests used in this investigation are IPS, LLC, and Breitung panel unit root tests. Individual effects, time trends, and common time effects are all supported by IPS. Individual, none, and individual and time trend effects are all allowed in LLC, whereas individual and trend effects are only allowed in Breitung. In the following table, the exact critical values of the t-bar statistic are given in IPS, LLC, and Breitung.

. The results of the Panel unit root test are shown in the table below.

Table 4: Panel Unit root test results

	Im-Pesaran-Shin		Levin-Lin-Chu		Breitung		
Variable	**Level**	**1st difference**	**Level**	**1st difference**	**Level**	**1st difference**	Order of Cointegration
lnRGDP_PC	-0.336	**-3.32*** **	-1.886**	**-3.881*** **	0.671	**-4.373*** **	**I(1)**
lnTI	-0.274	**-4.812*** **	-1.060	**-6.259*** **	-0.372	**-5.457*** **	**I(1)**
lnGCF	-1.003	**-5.442*** **	-0.949	**-6.259*** **	-0.372	**-5.457*** **	**I(1)**
lnFDEP	0.258	**-5.198*** **	-0.263	**-5.489*** **	-0.918	**-3.577*** **	**I(1)**
LF	-7.298***	**-10.63*** **	9.821***	**-12.612*** **	-1.138	**-2.084** **	**I(1)**
FAID	-0.795	**-5.257*** **	-1.059	**-5.148*** **	-1.413*	**-4.613*** **	**I(1)**
FDI	-1.955**	**-6.340*** **	-0.748	**-5.026*** **	-1.367*	**-5.273*** **	**I(1)**

Notes: ***, **And * indicates statistical significances ***p<0.01,**<0.05,*p<0.1 showing the rejection of the null hypothesis (unit root) at 1%, 5% and 10% respectively.

Source: Computation based on data of WB, 2021

[2] As noted before, the LLC, Breitungs and IPS tests require *N* to be relatively smaller than *T*, which is the same with our case.

As shown in the table 4 above LRGDP per capita, LTI, LGCF LFDEP, FDI, FAID and LF are non stationary al level and stationary after first difference. Further, when the first differences are used the null of unit root is strongly rejected at conventional level of significance and all variables are integrated of order one (I(1)). Given the results of Levin-Lin-Chu (LLC), Im-Pesaran-Shin (IPS) and Breitung panel unit root tests, it is possible to apply panel cointegration method in order to test for the existence of the stable long run relationship among the variables.

6.3.2 Panel Cointegration Tests

The above unit root test showed that the variables have same order of integration, that is, I (I).

The panel cointegration test is the mechanism of looking for the long run relationship among the variables under considerations. And, this is handled through two panel cointegration tests. These are the Engle-Granger based called Pedironi heterogeneous cointegration test and the residual based Kao cointegration test.

Table 5: Panel Pedironi Cointegration test results

(lnRGDP_PC lnTI lnGCF lnFDEP FDI AID LF)			
Tests	**Common AR coefficients (Within-Dimension)**		
	Intercept	**Intercept +Trend**	**None**
panel- v statistic	**-1.66**	**6.36*** **	**-1.58**
Panel rho-statistic	**3.58**	**3.68**	**2.31**
Panel pp- statistic	**-0.56**	**-1.65****	**-1.64***
Panel ADF-statistic	**-2.46*** **	**-0.03**	**-2.14****
	Individual AR coefficients (Between Dimension)		
Group rho-statistic	**4.13**	**4.43**	**3.32**
Group pp-statistic	**-2.39*** **	**-3.66*** **	**-4.15*** **
Group ADF-statistics	**-0.16**	**0.60**	**-1.43***

Note: ***, ** and * indicates statistical significance at ***P<0.01, **P<0.05,*p<0.1

Source: Computation based on data of WB, 2021

Further, according to Egbetunde and Anthony (2015) the critical value for Pedroni tests is –1.64 (in absolute value). Thus, any statistical value with the exception of the v-statistic that has a critical value greater than –1.64 (in absolute terms) implies the rejection of the null hypothesis of no cointegration and shows that the variables have long run relationships (Asteriou and Hall, 2007). However, Pedroni test will only be available for groups containing less than seven series so in addition to Pedroni (1999), this study considered additional panel cointegration tests, namely: Kao (1999).Kao cointegration tests under

table below suggest that the stochastic trends of unit root test have cancelled each other out – leading to stationary residuals. In practice, this means that these variables have a significant long-run relationship.

Table 6: Results of Kao Cointegration Test for the Model

Variables in co integration vector	**ADF t-statistic statistic -4.82*** **	**Prob. 0.0000**
Residual variance 0.0017 **HAC variance 0.0021**		

Source: Computation based on data of WB, 2021

Both Pedroni and Kao tests are all one-sided with a critical value of 1.64. The results of Pedroni and Kao cointegration tests revealed that there is a long run relationship among the variables. The null hypothesis of no cointegration is rejected at 1% level of significance for Kao's test.

6.4 Econometric Results and Discussions

Table 7: Results of Fixed effect, Random effect, Pooled OLS and Dynamic panel data

Explanatory Variables	Estimation techniques							
	Fixed Effect (1)		**Random Effect(2)**		**Pooled OLS (3)**		**Dynamic Panel GMM(4)**	
	Coef.	**P_value**	Coff.	P_value	Coff.	P_value	Coff.	P_value
LTI	-0.913773 (0.03232)	**0.000*** **	-0.1809 (0.0344)	**0.000*** **	(0.93564) (0.1896)	**0.000*****	-0.19222 (0.03031)	**0.000*** **
LGCF	0.2615627 (0.011558)	**0.000*** **	(0.2588) (0.0123)	**0.000*** **	0.17698 (0.03010)	**0.000*****	0.2594 (0.0101)	**0.000*** **
LFDEP	0.1336216 (0.019751)	**0.000*** **	0.2683 (0.0167)	**0.000*** **	0.13879 (0.0666)	**0.051***	0.15853 (0.0183)	**0.000*** **
LF	0.0259725 (0.02068)	**0.210**	0.0284 (0.022)	**0.197**	0.381 (0.0576)	**0.000*****	-0.01512 (0.0031)	**0.538**
FDI	-0.00572	**0.097 ***	-0.0060 (0.004)	**0.108**	0.0174 (0.0202	**0.402**	-0.0088 (0.00217)	**0.004*** *

	63 (0.003431)				3)			
FAID	-0.00471 23 (0.00241)	**0.052***	(-0.0060) (0.0026)	**0.027****	-0.09671 (0.01328)	**0.000*****	-0.00431 (0.00082)	**0.047****
Constant	1.46894 (0.5591)	**0.009*****	1.4978 (0.3032)	**0.000*****	-0.8003 (1.2246)	**0.521**	1.559 (0.2212)	**0.000*****
F(7,221) 168.26 Wald chi2(7)= 1045.47 F(7, 19) = 690.90 Wald chi2(9) = 1989.19								
Prob >F	0.0000***		Prob> chi2 =0.0000***		Prob > F = 0.0000***		Prob>chi2 =0.0000***	
R-Squared	Within = 0.8420 Between = 0.2146 Overall = 0.2325		Within = 0.8418 Between = 0.2318 Overall = 0.2479		0.7776			
Root MSE	corr(u_i, Xb) = 0.1303		Corr (u_i, Xb)=0 (assumed)		0.4908			

Note: ***, ** and * are significant at 1%, 5% and 10% respectively. The bracket under coefficients represents the standard errors.

Source: Computation based on data of WB, 2021

The fixed effects model is appropriate for regression models, according to the Hausman test. Traditional fixed effects models, on the other hand, may produce biased standard errors and thus inefficient estimators when there is severe serial correlation and heteroscedasticity. As a result, it is expected to employ a regression model that generates robust standard error estimators. We used feasible generalized least squares to tackle the problems (FGLS).

Table 8: Feasible Generalized Least Square Estimation (FGLS) Results

LRGDP	Coefficient	Std. Err.	z P>|z|	[95% Conf. Interval]
LTI	0.9356382	0.1294603	-25.88 0.000***	0.6819006 1.189376
LGCF	0.1769833	0.035032	3.06 0.000***	0.1083219 0.2456447
LFDEP	0.1387945	0.0621505	20.73 0.026 **	0.0169817 0.2606073
LF	0.3809081	0.0551746	2.57 0.000***	0.2727678 0.4890483
FDI	0.0173571	0.0167676	17.75 0.301	-0.0155068 0.0502211
FAID	-0.0967085	0.0083706	-11.24 0.000***	-0.1131147 - 0.0803024

Wald chi2(7) = 2839.02

Prob > chi2 = 0.0000

Number of observation= 240 Time Period = 20

Note: ***, ** And * Coefficient is significant at 1%, 5% and 10% significance level

Source: Computation based on data of WB, 2021

When applying the first measure, the coefficient of trade integration is positive and is interpreted as elasticity. If all other variables remain constant, a 1% increase in trade openness results in a 0.94 percent gain in real GDP per capita. According to the data, trade integration has a positive impact on economic growth. To evaluate the result's robustness, we used export and import as a share of GDP separately.

As a result of the aforesaid findings, we may conclude that the findings are unaffected by changes in trade integration measures. Table 9 shows that trade integration, population growth rate, gross capital formation, and financial development are not only substantial but also have a beneficial impact on SSA nations' real GDP per capita. Foreign aid, on the other hand, undermines it. Foreign Direct Investment has a negligible positive influence on per capita real GDP.

The results of trade integration contradict previous empirical findings of (Dowrick and Golley (2004); Mputu (2016); Haystad and Jensen (2015); Sundaram and Arnim (2008); Chantal et al, (2011) and match with our positive theoretical expectation, particularly with the prediction of endogenous growth theories and empirical findings of (Muhammad and Toseef (2015); Dobre (2008); Mbabzi and Morrissey (2004) that integration of an economy can positively influence economic growth.

Furthermore, trade liberalization favors small economies more than large economies, according to Zekarias (2016), because tiny economies cannot control global supply and

thus global price. This means that their impact on global supply is insignificant in terms of influencing global demand and price levels. In the global market, the majority of countries in SSA are price takers. Furthermore, according to Krugman and Obstfeld (2007), any country benefits from international trade, at the very least in terms of comparative advantage.

Despite the fact that the majority of these countries are too small to have a big impact on the global economy, they have benefited greatly from international commerce. The sub-region has a trade deficit most of the time, yet trade contributes 1% to growth, which is positive and important. The explanation for this could be that they import more capital goods than consumer goods (which encourage investment and growth). This demonstrates the need of international trade integration for the region's continued economic progress. Sala's (2014) empirical evidence backs up this conclusion.

As a result of the above trade integration findings, we can deduce that outward-oriented economies grow faster because they allow for more efficient resource allocation, economies of scale, access to new technology, and the creation of business opportunities, all of which improve the living standards of Sub-Saharan African countries.

The FGLS coefficient on GCF can be translated as a 1% increase in Gross capital formation will result in a 0.18 percent increase in RGDP per capita, assuming all other variables remain constant. Again, this backs with the theoretical and empirical work of (Muhammad and Toseef, 2015; Pigka-Balanika, 2013), which claims that capital has a considerable and positive impact on economic growth. It also agrees with a neoclassical paradigm in which employees may generate more output with more equipment because, according to the Cobb- Douglas production function, labor is joined with output to produce goods and services, implying higher returns to capital and labor.

The conclusion of the foregoing result is that as capital falls, investment falls in some of these SSA nations, resulting in a slow pace of growth in these countries over time. Furthermore, when capital for manufacturing infrastructure grows, the value of exported commodities rises, boosting GDP per capita in SSA.

The data from the FGLS reveals that foreign direct investment has a favorable but minor impact on economic growth, which contradicts previous research Ayanwale (2007); Sala (2014); Zekarias (2016); Sukar (2004). According to them, FDI contributes to the economic progress of SSA countries by creating job opportunities, transferring technology and know-how, and stimulating the local private sector to enhance its competitive performance. However, FDI boosts capital stock and growth in a host economy by improving capital production, according to Solow's neoclassical growth model (Solow,1956).

The findings are consistent with those of Carkovic and Levine (2002); Chitambara (2015) claims that many African countries' failure to fully adopt foreign technologies may be due to a lack of absorptive capacity, and that the effect is minor because FDI spillovers are not automatic and are dependent on local conditions. Only when the host economy's human

capital development is sufficient, according to Xu(2000), is FDI more productive than domestic investment.

Financial deepening has a positive and significant impact on Sub-Saharan African countries, according to Ngongang (2015), who found that a 1% change in financial development on average leads to a 0.57 percent increase in economic growth when all other variables are held constant. This means that financial development leads to an increase in the savings rate, thereby increasing the resources available to finance investments, and it also results in an increase in the savings rate, which leads to an increase in the resources available to finance investments.

The study further supports Croitoru's (2012) conclusion that financial intermediaries, particularly credit institutions such as banks, play an important role in issuing loans to investors and entrepreneurs. They encourage innovative activities and economic growth by transferring capital from idle to entrepreneurial hands. As a result of the aforesaid findings, financial sector expansion has been identified as a good growth accelerator.

The labor force coefficient is similarly positive and substantial, meaning that a one-unit rise in population growth results in a 38 percent gain in real GDP per capita in SSA when all other variables are held constant. The findings are consistent with (Mputu, 2016; Muhammad and Toseef, 2015) but contradict empirical findings of Barro and Salan (1995) and Malthus (1826) population theory, which assumes that population growth can reduce output per capita because population grows at a geometrical rate while production grows at an arithmetic rate, so output growth rate cannot keep up.

However, the result is consistent with the expectations of neoclassical economists, who say that increasing the number of working people increases productivity, as well as endogenous growth theory, which claims that population growth encourages technological innovation. A big population generates a large domestic demand for products and services, resulting in increased production and growth.

Foreign aid coefficients are negative and large, which contradicts Harrod-theoretical Domar's expectation. There are two gaps in which foreign aid can be employed as a crucial tool in bridging the gap between saving and investment, trade gap, and fiscal gap. Table 6 shows that the coefficient of FAID is -0.097, which means that a one-unit increase in foreign aid results in a 9.7% drop in real GDP per capita when all other variables are held constant.

As a result of the aforementioned conclusion, we can deduce that increased foreign aid may reduce the economy's share by reducing domestic savings and raising domestic consumption. Furthermore, according to Albiman (2016), foreign aid is distributed based on political rather than economic needs. Furthermore, corruption and rent-seeking activities lead to the misallocation of resources received through aid, which can impede overall economic performance. Furthermore, according to Burnside and Dollar (2000), foreign aid is projected to have a detrimental influence on economic growth in developing nations with bad economic policies.

The inflation coefficient is unexpectedly positive and significant, implying that when inflation rises by one unit on average, economic growth rises by 0.5 percent, all other factors remaining constant. The result contradicts our expectation and endogenous growth theory, which claims that variables such as inflation lower the rate of return, which reduces capital accumulation and slows growth, and is consistent with Keynesian theories, which regard inflation as a reflection of high aggregate demand. Stable inflation, according to these findings, can encourage investment and economic growth by supporting the efficient use of productive resources.

7. Conclusions

The impact of trade integration on economic growth in emerging nations is a hot topic among economists. These become more appealing when it comes to countries in Sub-Saharan Africa, which have low economic performance and are more exposed to international trade and exposures. A fundamental concern is whether specializing in primary product export and trade was beneficial to growth by increasing productivity and finance and thus speeding up the process of trade liberalization, or whether participating in international trade is harmful in order to focus on export diversification.

To address these challenges, the study used data from the World Development Indicators (WDI) from 1995 to 2018 to examine the impact of trade liberalization on economic growth in 12 SSA nations. Panel data fixed effects; Random Effects, Pooled OLS, Dynamic GMM, and FGLS models are evaluated by adjusting for unobserved country specific and time effects. In terms of the stationarity test, more variables are stationary at first difference, but one becomes stationary at level. Pedroni and Kao cointegration experiments revealed the existence of a long run link between trade integration and economic development when the variables were stationarized.

The key outcome of the analysis is that openness to international trade is advantageous to economic growth, indicating that engaging in international trade is the largest contributor of economic growth in Sub-Saharan Africa. Other determinants of economic growth, such as Gross Capital Formation, Financial Development, and labor force, have a positive impact on economic growth in SSA countries, whereas Foreign Aid has a negative impact. These findings suggest that any strategy that increases the flow of these factors can aid SSA nations' GDP growth.

Finally, SSA recommended aggressively participating in international trade since it promotes technology transfer, information sharing, and possibilities to achieve economies of scale and high volume investment. As a result, expanding trade openness is a good way for SSA to improve private sector development and long-term economic progress.

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