



# Foreign Direct Investment-Trade nexus in sub-Saharan Africa: Does the institutional quality matter?

Jasnine MOGEM KOUAM<sup>\*</sup>, Luc NEMBOT NDEFFO<sup>\*\*</sup>, Mathurin Aimé MEKAM POUATCHA<sup>\*\*\*</sup>

## ARTICLE INFO

### Article history:

Accepted July 2020

Available online August 2020

### JEL Classification

E20, E22

### Keywords:

Foreign Direct Investments, Trade, Institutions, sub-Saharan Africa, SGMM

## ABSTRACT

This paper investigates the effect of Foreign Direct Investment (FDI) on international trade using 34 sub-Saharan African countries over the period spanning from 1996 to 2017. Especially, we evaluate the role institutional quality play on the FDI-trade nexus. Our analysis was carried out using the System Generalized Methods of Moments (SGMM) to accommodate endogeneity. The following results are established: first, there is a complementarity between FDI and international trade and this result is robust to alternative specifications and other indicators for trade. Secondly, the results showed that, sound institutions help FDI promote trade in the region. Finally, natural resources rents, domestic investments, institutions, population growth and inflation are significant determinants of trade in the region.

© 2020 EAI. All rights reserved.

## 1. Introduction

The dynamics of globalization in the past decades has led to major macroeconomic changes observed by an increasing trend in the movement of goods, services and capital flows across the globe. The question of globalization and its benefits have been at the core of debates between academicians and policymakers. Foreign Direct Investment (FDI) and international trade can be identified as two important vectors of globalization (Magalhães & Africano, 2007; Simionescu, 2014; Dima, 2016).

In recent years, FDI which is a source of foreign capital has played a very important role in the development process of developing countries, where the level of domestic investment remains very low to boost domestic production. Among the different sources of foreign capital, FDI remains the largest source of external capital for developing economies, reaching US\$42 billion in 2017 (CNUCED, 2018). However, the increasing trend in inward FDI which was observed over the last two decades in Africa has experienced a downturn in recent years. For example, FDI to the region decreased from US\$54 billion in 2015 to US\$ 42 billion in 2017, a decline of around 22%. This decrease is mainly due to the fact that low oil prices and the negative effects of the commodity crisis resulted in a slowdown in FDI inflow to the region, particularly in the major commodity exporting countries.

As earlier mentioned, globalization led to an increase in capital flows and the volume of international trade amongst countries. For instance, the World Trade Statistical Review reports that in 2017, global trade attained its highest value both in volume and value terms in six years with developing countries contributing to around 43 % of world trade (WTO, 2018). In the case of Africa, international trade has witnessed a decline in the past years. This happened because of a failure in the diversification strategy which resulted to the accruing dependence of these countries on commodities with low value added whose price volatility may slow economic growth. Moreover, the low level of production and investment together with the poor transport infrastructure explains Africa's low contribution to global trade. Hence, in order to successfully integrate into the world economy, sub-Saharan African countries must increase their growth level and reduce their level of poverty (Ekodo & Nkot, 2017). Consequently, investment in different sectors in African economies will somehow enhance the region's contribution to world trade. This is acknowledged by several studies, which suggest that it is essential to promote domestic investment and FDI in order to reduce poverty and to achieve sustainable development (Asiedu, 2002; Asiedu, 2006; Babatunde, 2011).

Many studies in the literature on FDI focus on its effect on economic growth (Alabi, 2019; Carbonell & Werner, 2018; Khun, 2018; Awolusi *et al*, 2017; Jugurnath *et al*, 2016; Dritsaki & Stiakakis, 2014). Few studies investigate the possible nexus which exists between FDI and international trade in Africa. Ekodo & Nkot (2017) investigate the FDI-international trade nexus in the case of Cameroon while Aihu & Chedjou (2018)'s

<sup>\*</sup>, <sup>\*\*</sup>, <sup>\*\*\*</sup> University of Dschang, Faculty of Economics and Management, Dschang, Cameroon. E-mail addresses [mjasnine@yahoo.fr](mailto:mjasnine@yahoo.fr) (J. Mogem Kouam- Corresponding author), [ndefluc@yahoo.fr](mailto:ndefluc@yahoo.fr) (L. Nembot Ndeffo), [mekampouatcha@yahoo.fr](mailto:mekampouatcha@yahoo.fr) (M. A. Mekam Pouatcha)

study focuses on African countries. However, it is worth noticing that the later highlight the importance of institutions on trade. Hence, our study differs from theirs in two respects; firstly, we are interested in investigating the link between FDI on international trade in sub-Saharan Africa and secondly, we analyse the role institutional quality play on the effect of FDI on international trade.

Following the previous studies on the effect of FDI on international trade, our paper further investigates the effectiveness of FDI in the region. Specifically, we contribute to the existing literature in three ways. First, we investigate the relationship between FDI and international trade in the region. Secondly, we make a step forward in understanding the linkage between FDI and international trade in the region by testing both the effect of inward and outward FDI on imports and exports. Finally, we contribute to the literature by analysing the non-linear effect of FDI on international trade and investigate the role that institutional quality plays in the FDI-trade nexus.

Our paper is organized as follows: Section (2) presents a literature review of the effect of FDI on international trade. Section (3) presents the methodology. The results are discussed in Section (4). Finally, the conclusion and policy recommendations are presented in Section (5).

## **2. Literature review**

Trade models identify two types of FDIs, Horizontal and Vertical FDI. Whereas Vertical FDI implies the displacement of different stages of production of MNEs into different locations, Horizontal FDI entails the replication of a firm in a foreign economy. This implies that the foreign firm produces the same goods as its parent company and serves the local market. From a macroeconomic viewpoint, these two forms of FDI have antagonistic effect on international trade. Vertical FDI is observed in situations where we have a positive effect of FDI on international trade while horizontal FDI usually results to a substitution effect between FDI and international trade (Chiappini, 2011). The linkage between FDI and international trade is ambiguous in the literature. Some scholars found a positive effect of FDI on international trade (complementarity effect) while others revealed a substitution effect between the two macroeconomic variables. Magalhães & Africano (2007) note that most empirical results find a complementary effect of FDI on international trade rather than a negative linkage.

The first stream of literature reveals a positive effect of FDI on international trade. Hejazi & Safarian (2001) found a positive linkage between FDI and international trade. This result is confirmed by Aizenman & Noy (2005) who evaluate the linkage between FDI and international trade in both developing and industrialized countries over the period from 1982 to 1998. The empirical finding showed a positive nexus between FDI and international trade. Moreover, they found that FDI had a stronger impact on international trade in developing countries than in the developed ones. In the same vein, Simionescu (2014) investigated the linkage between FDI and international trade using several methods such as Granger causality tests, unit root test and ADF test for panel data for the period 2002 to 2013 for the Group of Seven (G7) countries. He found only short run causality between FDI and both exports and FDI and imports. Jayakumar et al (2014) found a complementary linkage between FDI, imports and exports in India. A Similar result was obtained by Ekodo & Nkot (2017) in Cameroon. Tham et al (2017) found a complimentary relationship between inward and outward FDI and international trade on Malaysia's bilateral export trade at sectoral level. Finally, Aihu & Chedjou (2018) explore the linkage between FDI from china and international trade of 52 African countries for the period 2000 to 2015. The result revealed that FDI from china had a strong complementary relationship with international trade.

On the contrary, another strand of the literature suggests a substitution effect between FDI and international trade. Pain & Wakelin (1998) investigate the linkage between FDI and exports for 11 OECD countries over the period 1971-1995. Their empirical result indicates an overall small negative relationship for all countries in their sample. This contrasts with data for Japan, Italy and Denmark which support the opposite idea that net outward investment improved export performance. Similarly, Blonigen (2001) carried a micro-economic study to explore the substitution between foreign production and exports using dataset at product-level from 1972 to 1996. The findings indicate both a substitution and complementary effect between affiliate production and exports with Japanese automobile parts for the US market. The study also reveals evidence of substitution using product-level data on a set of Japanese-produced final consumer goods. Finally, Chiappini (2012) study of the French automotive industry revealed that the increase in foreign production strongly affected France's export performance in the sector, suggesting a negative linkage between FDI and exports in the French automotive sector.

## **3. Methodology**

### **3.1. Data**

In this sub-section, we first describe our data and subsequently present the model. Annual data are from the World Development Indicator (WDI) and the World Governance Indicator (WGI). The sample comprises 34 sub-Saharan African countries with data spanning from 1996 to 2017. Nevertheless, it is worth

noting that the period of this study and the sample selection were guided by the availability of data, placing our focus on proxies for institutions which start from 1996 onwards.

We have three dependent variables: trade/GDP (%), Exports/GDP (%) and Imports /GDP (%) all are taken from the *World Development Indicator database*. Our explanatory variables include FDI net inflow and net outflow, population growth, total natural resources rents, domestic investment, GDP per capita growth, infrastructure and inflation all are taken from the *World Development Indicator database*. In order to measure the institutional quality, this paper uses the data on institutional variables from the *Worldwide Governance Indicators (WGI)*. The WGI database is produced by the World Bank group, and this paper considers six indicators as measures of institutional quality: political stability, control of corruption, government effectiveness, regulatory quality, rule of law and Voice and Accountability. These indicators range from -2.5 to +2.5 where -2.5 indicate weak institutional quality and +2.5 reflects good institutional quality. We summarize all this in table 1 below:

**Table 1 Description of variables and sources of data**

Variables	Measures	Sources
<i>dependent variables</i>		
Trade	Trade/GDP (%)	WDI
EXP	Exports/GDP (%)	WDI
IMP	Imports/GDP (%)	WDI
<i>explanatory variables</i>		
FDIIN	Foreign direct investment inflow/GDP (%)	WDI
FDIOUT	Foreign direct investment outflow/GDP (%)	WDI
POP	Population growth (%)	WDI
Rwmat	Total natural resources rents/GDP (%)	WDI
INV	Gross fixed capital formation/GDP (%)	WDI
GDP	GDP per capita growth (%)	WDI
INFRA	Mobile cellular subscriptions (per 100 people)	WDI
INFL	Inflation consumer price	WDI
<i>institutional quality</i>		
PS	Political Stability	WGI
CORR	Control of Corruption	WGI
QLGVT	Government Effectiveness	WGI
RQ	Regulatory Quality	WGI
RL	Rule of Law	WGI
VA	Voice and Accountability	WGI

Source: authors

### 3.2 Model specification.

Our empirical model is inspired from the literature on international trade (Yakubu *et al*, 2018), where international trade is a function of foreign direct investment and other control variables as shown in Equation (1) below:

$$T_{it} = f(FDI_{it}, X_{it}, \varepsilon_{it}) \quad (1)$$

Where  $T_{it}$  denotes trade of country  $i$  in time  $t$ .  $FDI_{it}$  represents Foreign Direct Investment,  $X_{it}$  is a set of control variables which are determinants of trade; Population, GDP, Inflation, Domestic investment, Total natural resources rents, Infrastructure and institutions.

We then proceed by investigating the relationship between FDI and international trade. To begin, we specify Equation (2) to ascertain the direct effect of FDI on international trade:

$$T_{it} = \beta_0 T_{it-1} + \beta_1 FDI_{it} + \gamma X_{it} + \lambda_i + \mu_t + \varepsilon_{it} \quad (2)$$

Where  $T_{it-1}$  is the lag term of international trade which captures the initial conditions of international trade flows in the region. The sign of  $\beta_0$  enables us to verify the region's convergence trade effect,  $\lambda_i$  is the country specific fixed-effects,  $\mu_t$  is the time specific-effect and  $\varepsilon_{it}$  the error term.

In order to investigate the role that institutions play on the FDI-trade nexus, we use a non-linear equation where we include an interaction variable. In this light, we interact FDI with the indicator for institutional quality and the sign of  $\beta_3$  gives the nature of the role that institutions play on the linkage between FDI and international trade in the region. More precisely, a positive coefficient means that

institutional quality enables FDI to stimulate trade. Conversely, a negative sign of the coefficient of the interaction variable will indicate that FDI and institutions are substitutes showing that poor institutions will deter the effect of FDI on international trade. We use the following specification:

$$T_{it} = \beta_0 T_{it-1} + \beta_1 FDI_{it} + \beta_2 INST_{it} + \beta_3 (FDI_{it} * INST_{it}) + \gamma X_{it} + \eta_i + \mu_t + \varepsilon_{it} \quad (3)$$

In order to estimate our model, we use System Generalized Method of Moments (SGMM) following Arellano & Bover (1995) and Blundell & Bond (1998). We verify that the important econometric condition of a short T and a large N is respected. Moreover, the Hansen's test of over-identifying restrictions and the test of autocorrelation are used in order to insure the validity of the instruments we used for our estimations. A GMM estimator can be constructed by using valid internal instruments and they are based on differencing the regressors. When lagged levels of the exogenous variables are used as instruments, this refers to the difference GMM. However, due to the different shortcomings of the difference GMM (DGMM), a System GMM estimator which uses lagged differences of both the dependent and explanatory variables as instruments, is used. The System GMM estimator is constructed by combining the level and first-difference specifications (Arellano & Bover, 1995 and Blundell & Bond, 1998) which mitigates the shortcomings of the difference GMM. This estimation technique is important because it helps us overcome the endogeneity problem which may bias our results.

**Table 2 Descriptive statistics**

<b>Variables</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<i>Dependent variables</i>				
<b>Trade/GDP</b>	70.50388	34.21524	20.72252	225.0231
<b>Exports /GDP</b>	31.23283	18.854	4.685804	107.9944
<b>Imports /GDP</b>	39.27105	17.66087	10.79023	117.1538
<i>Independent variables</i>				
<b>FDI inflow/GDP</b>	3.554477	5.630698	-8.589432	57.83755
<b>FDI outflow/GDP</b>	1.520129	4.624309	-24.94459	50.63641
<b>Population growth</b>	2.468439	.9150152	-2.628656	8.117928
<b>Natural resources rents</b>	11.4876	11.08233	.0011335	59.61957
<b>Investment/GDP</b>	20.41352	8.530579	-2.424358	60.01827
<b>GDP per capita</b>	1.625522	4.249564	-36.20319	28.67596
<b>infrastructure (per 100 people)</b>	37.76109	42.52428	0	173.4966
<b>inflation consumer Price</b>	9.10408	33.1918	-8.97474	513.9068
<i>institutional quality variables</i>				
<b>Political Stability</b>	-.4994642	.8873363	-2.844653	1.28206
<b>Control of Corruption</b>	-.594481	.5948813	-1.722926	1.216737
<b>Government Effectiveness</b>	-.6701147	.6231187	-1.884151	1.056994
<b>Regulatory Quality</b>	-.5612742	.5884712	-2.297536	1.12727
<b>Rule of Law</b>	-.628121	.6328922	-2.129996	1.07713
<b>Voice and Accountability</b>	-.5139195	.6703563	-1.733551	1.007172

Source: Stata15 output with the data of the WDI 2018 and the WGI 2018

Table 2 above presents descriptive statistics for all the variables used for the estimation. It shows that FDI net inflows have a great variation, with the variable ranging from a negative value of -8.58% FDI net inflows to a maximum of 57.83 % of GDP for Seychelles in 2012. The mean of GDP per capita is 1.62% over the period of this study. Furthermore, mobile cellular subscriptions range from zero to a maximum of 173.49 mobile cellular subscriptions per 100 people. Population growth rate has an annual average growth rate of 2.46% in the region with a minimum value of 2.62% in Seychelles and a maximum value of 8.11% in Rwanda.

#### 4. Results

The results of our study on the FDI-international trade nexus are discussed in this section. To begin, Table (3) presents the regression results of the linear effect of FDI on international trade which is carried out using Equation (2). In this table, we display the results using OLS, DGMM (for comparative reasons) and SGMM in Columns one, two and three respectively.

The diagnostic tests of the validity of the instruments are displayed on the results of our preferred estimation technique, SGMM. The regressions satisfy both the Hansen test of over-identifying restrictions and the serial correlation test. The validity conditions are satisfied in all specifications, that is, the Hansen-J statistic does not reject the over-identifying restrictions, confirming the validity of the instruments.

Moreover, the p-value of the AR (1) and AR (2) tests show that there are no problems of correlation in the first and second order.

**Table 3 FDI and Trade nexus: Linear regression Dependent Variable trade (%GDP),**

<b>Independent variables</b>	<b>OLS</b>	<b>DGMM</b>	<b>SGMM</b>
<b>L.Trade</b>		0.449** (0.211)	0.574*** (0.192)
<b>FDI</b>	1.813*** (0.228)	0.560*** (0.146)	1.153*** (0.278)
<b>POP</b>	-16.62*** (2.071)	-2.926 (1.788)	-6.310*** (1.975)
<b>Rwmat</b>	1.047*** (0.112)	0.737* (0.392)	0.403** (0.187)
<b>INV</b>	0.406*** (0.125)	0.525*** (0.153)	0.207 (0.158)
<b>GDP</b>	-0.0872 (0.293)	-0.0127 (0.187)	0.0981 (0.137)
<b>INFRA</b>	0.0352 (0.0256)	-0.0490** (0.0204)	-0.0404** (0.0177)
<b>INFL</b>	-0.00920 (0.0141)	0.243 (0.155)	-0.000920 (0.0203)
<b>INST</b>	12.22*** (1.189)	1.356 (2.016)	6.084* (3.136)
<b>R-squared</b>	0.560		
<b>AR(1)</b>		0.029	0.003
<b>AR(2)</b>		0.746	0.782
<b>Hansen</b>		0.255	0.669

Note: Robust Standard Errors are reported in parentheses. We denote the significance levels at 1%, 5%, 10%, (\*\*\*) (\*\*), (\*) respectively.

The coefficient of FDI is positive and significant at 1% level using both OLS and DGMM. Similarly, results displayed in Column (3), using the SGMM (our preferred estimation technique), indicate that FDI has a positive and significant effect on international trade. This is in line with the theory as it shows the prevalence of vertical FDI in the region. Our results are similar to Hejazi & Safarian (2001), Aizenman & Noy (2005) and Aihu & Chedjou (2018); but in contrast with those obtained by Pain & Wakelin (1998) and Blonigen (2001). The result also indicates that present international trade is strongly path dependent as the coefficient of lagged international trade is found to be positive and statistically significant.

Furthermore, other determinants of international trade, our findings show that natural resources rents have a positive and significant relationship with international trade. Therefore, the availability of natural resources rents generates a comparative advantage thereby promoting international trade; this result corroborates the work of Otrou (2007). In the same vein, Asiedu (2006) indicates that many MNEs invest in Africa because of the availability of natural resources.

In addition, infrastructure has a negative and significant link with international trade at 5% significance level. This indicates that the low quality of infrastructure in the region limits market access for exports from the other parts of the world. Indicating that poor communication infrastructure does not promote international trade. Our result contrast with those of Francois & Manchin (2013), Ismail & Mahyideen (2015) and Celbis *et al* (2013) who found a positive and significant relation between infrastructure and international trade.

Population growth, which gives an indication of the market size, has a negative and significant effect on international trade at 1% level. This suggests that, the large domestic market of the region leads to an increase in domestic demand thereby reducing trade with foreign markets.

Finally, findings show that institutions have a positive relationship with international trade at 10% significance level, indicating that a stable political environment promotes international trade; our result is in line with that of Francois & Manchin, (2013). Hence sound institutions help countries promote international trade and economic growth, Dollar & Kraay, (2003).

#### **4.1 Robustness Checks**

The results obtained from the estimation of Equation (2) show that FDI enhances international trade in the region. Hence, we try to verify the validity of our results by carrying a number of robustness checks. Firstly, we consider alternative specifications to confirm our baseline results displayed in Table 4. Furthermore, we use

alternative measures for international trade to see whether we obtain the same results. We perform our analysis using outward FDI to better understand and confirm the complementary nature of the FDI-trade nexus. Lastly, we explore the role institutional quality plays on the linkage between FDI and international trade using Equation (3).

#### 4.1.1 Alternative specifications

In our first robustness check, we re-examine the effect of FDI on international trade by removing some variables from Equation 2 to verify if our baseline results still hold. To achieve this aim, we remove in different steps three explanatory variables; Population, investment and GDP to see if the result remains unchanged. The results are displayed in Table (4) with Column 1, Column 2 and Column 3 indicating regression results when we remove from our main equation; INV, POP and GDP respectively.

**Table 4 FDI and trade nexus: Alternative specifications using SGMM**

<b>explanatory variables</b>	<b>INV</b>	<b>POP</b>	<b>GDP</b>
<b>L.Trade</b>	0.732*** (0.118)	0.988*** (0.0316)	0.563*** (0.180)
<b>FDI</b>	0.925*** (0.267)	0.412*** (0.121)	1.164*** (0.249)
<b>Rwmat</b>	0.276** (0.128)	0.0259 (0.0449)	0.429** (0.187)
<b>INFRA</b>	-0.0269* (0.0158)	-0.0121 (0.00785)	-0.0406* (0.0201)
<b>INFL</b>	0.00136 (0.0215)	0.00569 (0.0262)	-0.00749 (0.0167)
<b>INST</b>	3.925*** (1.357)	0.114 (0.676)	5.985* (2.996)
<b>INV</b>		-0.0194 (0.0538)	0.183 (0.144)
<b>POP</b>	-4.351** (1.605)		-6.258*** (1.903)
<b>GDP</b>	0.176 (0.138)	0.163 (0.155)	
<b>Constant</b>	25.69** (9.882)	0.0349 (2.085)	37.42*** (11.38)
<b>AR(1)</b>	0.001	0.001	0.003
<b>AR(2)</b>	0.921	0.887	0.772
<b>Hansen</b>	0.560	0.385	0.631

Note: Robust Standard Errors are reported in parentheses. We denote the significance levels at 1%, 5%, 10%, (\*\*\*), (\*\*), (\*) respectively.

The findings indicate that, the size of the coefficient is different in all the three specifications however FDI stimulates international trade in the region. Moreover, we note that, when POP is removed from the main specification, infrastructure, institutions and natural resource become insignificant but have the same signs obtained in our best line results. This is because the market size which is captured by population growth is an important determinant of trade, hence removing it leads to a misspecification of our model.

#### 4.1.2 Results using different measurements for trade and FDI

Firstly, in our main results, trade has been defined as the sum of imports and exports/GDP (%). We now employ alternative measures of trade to see whether the results will change. More precisely, we consider as proxies for trade, imports/GDP (%) and exports/GDP (%). In addition, we empirically verify the effect of both inward and outward FDI on the different proxies of international trade mentioned above. The results of these robustness checks are shown in Table 5 with the 1<sup>st</sup> column showing the effect of inward-FDI on international trade (our baseline results) and the 2<sup>nd</sup> and 3<sup>rd</sup> columns indicating the effect of inward-FDI on exports and imports respectively. The 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> columns indicate the results of the effect of outward-FDI on international trade, exports and imports respectively.

**Table 5 FDI and trade nexus: Alternative measurement of trade and FDI**

	INWARD FDI			OUTWARD FDI		
	Trade	EXP	IMP	Trade	EXP	IMP
L.Trade	0.574*** (0.192)			0.639*** (0.183)		
L.Exp		0.659*** (0.192)			0.643** (0.246)	
L.IMP			0.555*** (0.100)			0.664*** (0.142)
FDIIN	1.153*** (0.278)	0.373** (0.141)	0.709*** (0.166)			
FDIOUT				0.465*** (0.133)	0.0933 (0.140)	0.336* (0.192)
POP	-6.310*** (1.975)	-3.410** (1.546)	-3.130** (1.402)	-5.486*** (1.947)	-3.580* (2.034)	-2.774* (1.430)
Rwmat	0.403** (0.187)	0.330* (0.189)	0.0782 (0.0840)	0.422* (0.218)	0.367 (0.245)	0.0923 (0.0907)
INV	0.207 (0.158)	-0.0110 (0.0717)	0.230** (0.103)	0.395** (0.178)	0.0976 (0.0919)	0.311*** (0.104)
GDP	0.0981 (0.137)	0.0470 (0.106)	-0.00291 (0.144)	0.0235 (0.121)	0.0527 (0.148)	-0.0374 (0.131)
INFRA	-0.0404** (0.0177)	-0.0172 (0.0139)	-0.0217 (0.0139)	-0.0354** (0.0145)	-0.0136 (0.00944)	-0.0202** (0.00955)
INFL	-0.000920 (0.0203)	-0.0137 (0.0114)	0.00513 (0.0160)	-0.00313 (0.0202)	-0.00809 (0.0123)	0.00904 (0.0176)
INST	6.084* (3.136)	2.960* (1.525)	1.997* (1.125)	5.561* (2.818)	3.153 (2.059)	1.673 (1.251)
Constant	36.33*** (12.44)	16.13** (7.170)	18.33*** (5.330)	28.95** (11.82)	15.21 (9.468)	13.34* (6.691)
AR(1)	0.003	0.003	0.004	0.012	0.014	0.008
AR(2)	0.782	0.678	0.797	0.752	0.413	0.877
Hansen	0.669	0.276	0.385	0.373	0.361	0.352

Note: Robust Standard Errors are reported in parentheses. We denote the significance levels at 1%, 5%, 10%, (\*\*\*), (\*\*), (\*) respectively.

Our findings show that inward-FDI promotes exports from the region at 5% significance level. A one-unit change in inward-FDI leads to an increase in exports by 0, 37. This happens when the host countries have competitive advantages in terms of labor cost (Albulescu & Goyeau, 2019). Furthermore, our results show a positive nexus between inward-FDI and imports. That is, Inward-FDI enhances imports in the region at a 1% level of significance. More precisely, a unit increase in inward-FDI leads to an increase in imports by 0.7 thereby providing evidence that, inward-FDI in the region is motivated by the fact that parent companies try to get better access to the region's market, a similar result is found in Herrmann & Jochem (2005). From the above results we can observe that inward-FDI enhances more imports than exports in these countries.

Secondly, outward-FDI equally promotes international trade as indicated in Column (4). In particular, the results show a positive and significant effect of FDI on international trade, but we can better understand this linkage by investigating the effect of outward-FDI on imports and exports respectively. Our empirical findings show that outward-FDI promotes imports at a 10% significance level. A one-unit change in outward-FDI leads to a 0.33 increase in imports. This result provides evidence on backward vertical integration and relocation of labor-intensive activities abroad from a capital-intensive country (Albulescu & Goyeau, 2019). We do not have any empirical evidence on the outward-FDI-export nexus in Sub-Saharan African.

#### 4.1.3 Non-linear effect of FDI on international trade.

We continue our analysis on understanding the FDI-trade nexus by investigating the non-linear relationship between the two variables. Specifically, we analyse the role that institutions play on the effect of FDI on international trade. To achieve this, we use Equation (3) where we modify Equation (2) by adding the interaction term between FDI and Institutions which is proxied by Political stability. We make sure that our results are robust when using different proxies for Institutions like Rule of law, regulatory quality, voice and accountability, Control of Corruption and Government Effectiveness. The regression results are reported in table 6 below.

**Table 6: FDI, quality of institutions and trade.**

	PS	RL	CORR	QLGVT	RQ	VA
L.Trade	0.604*** (0.0616)	0.824*** (0.0321)	0.843*** (0.0236)	0.825*** (0.0237)	0.849*** (0.0238)	0.840*** (0.0370)
FDI	0.790*** (0.222)	1.319*** (0.192)	0.753*** (0.153)	1.069*** (0.168)	1.251*** (0.210)	1.255*** (0.167)
POP	-5.891*** (0.971)	-3.924*** (0.665)	-3.303*** (0.638)	-3.306*** (0.648)	-3.308*** (0.630)	-3.238*** (0.881)
Rwmat	0.431*** (0.0650)	0.277*** (0.0380)	0.249*** (0.0300)	0.248*** (0.0369)	0.188*** (0.0328)	0.220*** (0.0471)
INV	0.384*** (0.0828)	0.172*** (0.0572)	0.151** (0.0569)	0.0723* (0.0408)	0.0578 (0.0368)	0.120** (0.0554)
GDP	0.142 (0.0953)	0.175** (0.0663)	0.129* (0.0738)	0.111 (0.0716)	0.136** (0.0668)	0.113* (0.0632)
INFRA	-0.0398*** (0.0111)	-0.0460*** (0.00843)	-0.0388*** (0.00687)	-0.0415*** (0.00738)	-0.0365*** (0.00536)	-0.0462*** (0.00881)
INFL	0.00226 (0.0118)	-0.0240*** (0.00635)	-0.0177** (0.00686)	-0.0182** (0.00676)	-0.0169** (0.00702)	-0.0224*** (0.00676)
PS	4.971*** (1.781)					
FDI*PS	0.442** (0.204)					
RL		-1.894 (1.459)				
FDI*RL		1.215*** (0.256)				
CORR			0.211 (1.212)			
FDI*CORR			0.616*** (0.179)			
QLGVT				1.068 (1.172)		
FDI*QLGVT				0.569*** (0.203)		
RQ					-0.203 (1.400)	
FDI*RQ					0.727** (0.275)	
VA						-0.827 (1.447)
FDI*VA						0.938*** (0.220)
Constant	29.73*** (4.326)	14.60*** (4.069)	13.93*** (3.447)	16.64*** (3.025)	14.27*** (3.375)	13.53*** (4.338)
AR(1)	0.001	0.000	0.001	0.001	0.001	0.001
AR(2)	0.915	0.757	0.789	0.816	0.814	0.806
Hansen	0.495	0.269	0.261	0.240	0.287	0.237

Note: Robust Standard Errors are reported in parentheses. We denote the significance levels at 1%, 5%, 10%, (\*\*\*), (\*\*), (\*) respectively.



The first column of Table 6 illustrates regression results when we include the interaction term between FDI, and Political stability and this term is positive and statistically significant. Our findings equally indicate that, FDI enhances international trade in the region. This indicates that good institutions help promote the effect of FDI on international trade and low institutional quality deter the impact of FDI on international trade. Thus, FDI and institutions are complements in enhancing international trade.

We use different indicators for Institutions to estimate Equation (3) in order to validate the results obtained above. The results are displayed in Columns (2-6) of Table 6. The estimations results indicate that in all the cases, FDI and its interaction with the respective proxies for Institutions are significant and positive. This confirms our result, indicating that the presence of sound institutions helps FDI stimulate international trade. So, the absence of violence and terrorism, a good electoral process, low corruption levels, a legal and regulatory system involving protection rights, contract enforcement help create a good environment for MNEs and investors to operate in the host countries.

Similarly, on average the control variables which are significant in our first regression (Equation 2) are found to maintain their sign and level of significance on international trade. However, we noticed that Inflation, which was not significant in the previous regressions, became negative and significant. This indicates that a fall in domestic average price of goods and services enhances international trade through exports.

Also, table 6 shows that domestic investment promotes international trade. The coefficient associated with this variable is positive and significant. This means that, an increase in physical capital leads to an increase in production and international trade. Our result is in line with Ekodo & Nkot (2017).

## 5. Conclusions

The aim of this study was to assess whether FDI promotes or deter international trade and the role institutional quality play on the FDI-trade nexus. We use a System GMM for a dynamic panel of 34 sub-Saharan African countries over the period 1996-2017. Our findings show that FDI has a positive effect on trade in the region. Our result is robust to alternative specifications and the use of other proxies for trade and FDI. Our results are in line with the works of Hejazi & Safarian (2001), Aizenman & Noy (2005), Aihu & Chedjou (2018) but contradicts those obtained by Pain & Wakelin (1998) and Blonigen (2001).

Furthermore, we find evidence on the fact that, sound institutions stimulate the effect of FDI on international trade in the region. We further confirm the role of institutional quality on the FDI-trade nexus when we employ alternative indicators for Institutions; Control of corruption, government effectiveness, Rule of law, voice and accountability and regulatory quality.

This study shows the determinants of international trade in the region. Natural resources rents, Domestic investment and Growth rate, all have a positive and significant impact on trade. On the contrary, Inflation, Population growth and Infrastructure are negative and statistically significant.

Following the results presented in this paper, we recommend African governments and their development stakeholders, to design strategies which can attract FDI, for example they can invest in human capital. Additionally, given the importance of good institutions on the linkage between FDI and international trade, sub-Saharan African governments should stress on fighting against corruption, improving democratic processes, enforce policies and regulations that promote private sector development if they want to properly utilise the inflow of FDI in their respective countries. Also, these countries need to improve the quality of their infrastructures in order to promote trade in the region.

## Acknowledgements

The authors are grateful to Hervé Kaffo Fotio, Arsène Aurelien Njamen Kengdo and Ahmed Shiraj for their comments and suggestions

## References

1. Aihu, W., & Chedjou A. B. (2018), "Effect of Chinese outward foreign direct investment on international trade of Africa", *African Journal of Business Management*, Vol 12(7), pp 188-211.
2. Aizenman, J., & Noy, L. (2005), « FDI and Trade two-way linkage? », *National Bureau of Economic research, Working Paper*.
3. Alabi, K. O. (2019), « The impact of foreign direct investment on Economic growth: Nigeria Experience », *Open Journal of Applied Sciences*, Vol 9, pp 372-385.
4. Albuлесcu, C. T., & Goyeau, D. (2019), "The interaction between trade and FDI: the CEE countries experience.", *International Economics and Economic Policy*, Springer, vol. 16(3), pp 489-509; <https://doi.org/10.1007/s10368-019-00438-1>.
5. Arellano, M., & Bover, O. (1995), "Another look at the instrumental variable estimation of error-components models", *Journal of Econometrics*, 68 (1995) 29-51.
6. Asiedu, E. (2002), "On the Determinants of Foreign Direct Investment to Developing Countries: Is Africa Different?", *World Development*, 30(1), pp 107-119.
7. Asiedu, E. (2006), "Foreign direct investment in Africa: The role of natural resources, market size, government policy, institutions and political instability.", *The World Economy*, 29(1), pp 63-77.
8. Awolusi, O. D., Adeyeye, O. P., & Pelsler, T. G. (2017), "Foreign Direct Investment and economic growth in Africa: A comparative analysis", *International Journal of Sustainable Economy*, Vol 9, Issue 3.
9. Babatunde, A. T. (2011), "trade openness, infrastructure, FDI and growth in Sub-Saharan African countries", *Journal of management policy and practice*, Vol 12(7), pp 26-36.

10. Blonigen, B. A. (2001), « In search of substitution between foreign production and export », *Journal of International Economics*, 53, pp 81-104.
11. Blundell, R., & Bond, S. (1998), "Initial conditions and moment restrictions in dynamic panel data models", *Journal of Econometrics*, 87, pp 115-143.
12. Carbonell, J. B., & Werner, R. A. (2018), "Does foreign direct investment generate economic growth? A new empirical approach to Spain", *Economic Geography*, Vol 94(4), pp 425-456.
13. Celbiş, M. G., Nijkamp, P., & Poot, J. (2013), "How big is the impact of infrastructure on trade? Evidence from meta-analysis", *UNU-MERIT Working Paper Series No 032*, Maastricht Economic and social Research institute on Innovation and Technology (UNU-MERIT).
14. Chiappini, R. (2011), "FDI and trade: A Granger causality analysis in a heterogeneous panel", *Economics Bulletin*, 31(4), 2975-2985.
15. Chiappini, R. (2012), "Offshoring and export performance in the European automotive industry", *Competition and Change*, Vol 16 N°4, pp 323-342.
16. CNUCED. (2018), *Rapport sur l'investissement dans le monde 2018*, « L'investissement et les nouvelles politiques industrielles », repères et vue d'ensemble. Nation Unies.
17. Dima, S. (2016), "Globalization, trade openness and Foreign Direct Investment in Romania", *Studia Universitatis Economics series*.
18. Dollar, D., & Kraay, A. (2003), "Institutions, trade, and growth", *Journal of Monetary Economics*, 50, pp 133-162.
19. Dritsaki, C., & Stiakakis, E. (2014), "Foreign Direct Investment, Export and Economic growth in Croatia: A time series analysis", *Economics and Finance, Procedia*, Vol 14, pp 181-190.
20. Ekodo, R., & Nkot, S. C. (2017), "Investissement direct étranger et Commerce extérieur au Cameroun", *Journal of International Business and Economics*, Vol 5, No 1, pp 20-32.
21. Francois, J., & Manchin, M. (2013), "Institutions, Infrastructure, and Trade", *World Development*, Vol. 46, pp. 165-175.
22. Hejazi, W., & Safarian, A. E. (2001), "The Complementarity between U.S. Foreign Direct Investment Stock and Trade", *Atlantic Economic Journal*, Vol.29, Issue 4, pp. 420-437.
23. Herrmann, S., & Jochem, A. (2005), "Trade balances of the central and east European EU member states and the role of foreign direct investment.", *Deutsche Bundesbank Discussion Paper*, No. 41.
24. Ismail, N. W., & Mahyideen, J. M. (2015), "The Impact of Infrastructure on Trade and Economic Growth in Selected Economies in Asia", *ADB Working Paper Series*, No. 553, Tokyo: Asian Development Bank Institute. Available: <http://www.adb.org/publications/impact-infrastructure-trade-and-economic-growth-selected-economies-asia/>.
25. Jayakumar, A., Kannan, L., & Anbalagan, G. (2014), « Impact of foreign direct investment, imports and exports », *International Review of research in Emerging Market and global Economy (IRREM)*, Vol 1, No 1.
26. Jugurnath, B., Chuckun, N., & Fauzel, S. (2016), "Foreign Direct Investment and Economic growth in Sub-Saharan Africa: An empirical study", *Theoretical Economics Letters*, 6, pp 798-807.
27. Khun, S. (2018), "the impact of foreign direct investment on the economic growth in Cambodia: Empirical evidence", *International Journal of Innovation and Economic Development*, Vol 4, Issue 5, pp 31-38.
28. Magalhães, M., & Africano, A. P. (2007), "A Panel Analysis of the FDI Impact on International Trade", *FEP Working Papers* 235, Universidade do Porto, Faculdade de Economia do Porto.
29. Otrou, A.H. (2007), « les déterminants du commerce extérieur des pays de l'UEMOA », *Revue du CAMES-nouvelle série B*, vol .009 N 2, pp 236-241.
30. Pain, N., & Wakelin, K. (1998), "export performance and the role of foreign direct investment", *Manchester school supplement*, pp 62-88.
31. Simionescu, M. (2014), "the relationship between trade and foreign direct investment in G7 countries a panel data approach" *Journal of Economics and Development Studies*, Vol 2, No 2, pp 447-454.
32. Tham, S. Y., Goh, S. K., Wong, K. N., & Fadhli, A. (2017), "Bilateral trade, outward and inward FDI: A Dynamic gravity model Approach using sectorial Data from Malaysia", *Journal of Economic Literature*, F21.
33. WTO, (2018), *World trade statistical review 2018*, "The future of world trade: How digital technologies are transforming global commerce".
34. Yakubu, A. S., Aboagye, A. Q. Q., Mensah, L., & Bokpin, G. A. (2018), "Effect of financial development on international trade in Africa: Does measure of finance matter?", *The Journal of International Trade & Economic Development*, DOI: 10.1080/09638199.2018.1474246, pp 1-20.