

# Impact of Trade Openness on Domestic Investment in Sub-Saharan Africa

# Esperance Nyinawumuntu, Ulrich Ekouala Makala\*, Fuling Han

School of Finance, Central University of Finance and Economics (CUFE), Beijing, China Email: esperygas@yahoo.fr, \*leroyaemu@yahoo.fr, hanfuling@139.com

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# Abstract

This paper investigates the impact of trade openness on domestic investment in selected Sub-Saharan African countries. The study uses panel data of 19 African countries covering the study period 1980-2020. This research uses as a baseline model the pooled Ordinary Least Square (OLS) and fixed effects (FE) with robust standards errors and assuming an AR(1) disturbances. Further, we estimated the fixed effects with country specific effects assuming AR(1) disturbances and adjusted for autocorrelation, and finally, we used the random effects with instrumental variables and the Generalized Method of Moments (GMM) to deal with endogeneity issues in our data. The empirical findings give evidence of a positive impact of trade openness on domestic investment in Africa. Regarding our control variables, the research concludes on the one hand, that the weak development of the credit sector in Africa does not encourage domestic investment and on the other hand, it is argued that the size of population does not improve the domestic investment in Africa.

## **Subject Areas**

International Trade/Economy

# **Keywords**

Trade Openness, FDI, Domestic Investment, Sub-Saharan Africa

# **1. Introduction**

Foreign direct investment (FDI) gained major importance in enhancing the economic growth in developing countries, particularly in Sub-Saharan African countries where the economic growth seems to be subject to previous development in domestic investment structure. With regards to the FDI significance, trade openness appears, therefore, as a pertinent channel through which the FDI can impact the domestic investment and consequently the economic growth in Sub-Saharan Africa. Several studies have examined the weight played by trade openness toward economic growth in previous literature. Thus, the neoclassical theory acknowledged the role played by trade growth in empowering economic growth. Given this view, both developed and developing countries have given a particular focus on output growth while seeing the emerging market economies as the world engine of new demand growth and spending power (Wilson & Purushothaman, 2003) [1]. In this framework highlighting the significance of trade openness in economic growth, we can name the studies by Raghutla et al. (2018) [2] and Fetahi-Vehapi et al. (2015) [3]. In the first study, it is stressed that trade openness has a substantial positive impact on growth while investigating the impact of trade openness and financial development on economic growth in India. Similarly, the second study by Fetahi-Vehapi et al. (2015) [3] showed that trade openness has a positive effect on output growth while investigating the effect of trade openness on economic growth in the sample of South East European countries. Over the last decades, foreign direct investment inflows have provided strong incentives for economic development across countries. FDI serves as an important source of supply funds for domestic investment, thus, promoting capital formation in the host country (Omisakin et al. 2009) [4]. FDI inflows can assist an economy by giving opportunities for ameliorating the level of service sector (i.e. telecommunications, transport, banking and finance, wholesale and retail trade, business and legal services). During this period, there have been different components in the empirical and theoretical literature aimed at investigating the relationship between FDI inflows and their determinants in advanced and developing markets.

There exists empirical evidence showing that the development of the industry sector is enabled by the output demand, which output demand can be reached easily through a modern technology in the production process. Following that background, international trade plays a considerable role in improving the economic growth. For instance, Awokuse (2007) [5] documented that both exports and imports have a positive significant impact on economic growth in a case study of three transition countries, namely, Bulgaria, the Czech Republic, and Poland. The results are also supported by the export-led growth, import-led growth, and growth-led export hypotheses. Similar results were found in the study by Al Mamun and Nath (2005) [6] in the case of Bangladesh. Erfani (1999) [7] studied the impact of exports on economic growth in the case of the developing countries during 1965-1995. In its study, it was found that exports have a positive impact on economic growth and also reported that a higher level of exports leads to higher economic growth. Vohra (2001) [8] scrutinized the causal association between economic growth and exports in the case of five countries (India, Thailand, Malaysia, Pakistan, and the Philippines) during the study period 1973-1993. The empirical results acknowledged that export growth has a positive and substantial impact on economic growth. The study by Shan and Sun (1999) [9] investigated the export-led growth hypothesis in the U.S. economy, covering the period 1980-1997. Their empirical findings confirmed that imports have a positive considerable impact on economic growth, and they also reported a feedback causality relationship between exports and economic growth. Later, Sultan and Haque (2011) [10] examined the relationship between domestic investments, exports, and economic growth in India, over the periods 1970-1971 and 2007-2008. Their findings confirmed that both exports and domestic investments have a significant impact on economic growth. While investigating the nexus between exports and economic growth in India during 1971-2001; Sharma and Panagiotidis's (2005) [11] study indicated that there is no long-run relationship between exports and economic growth. However, some studies have established bidirectional and unidirectional causality relations. For instance, Awokuse (2008) [12] examined the causal linkages between imports, exports, and economic growth in the case of Colombia, Argentina, and Peru. The results confirmed the presence of a bidirectional causality relationship between economic growth and imports. Hatemi-J (2002) [13] examined the relationship between exports and economic growth in the case of Japan during 1960-1999. The author found a causal relationship between economic growth and exports. Similar results are reported by Awokuse (2005) [14] in the case of Japan, over the periods 1960-1961 and 1991-1994.

The literature has shown that a variety of characteristics of the host country affect FDI decisions *i.e.* openness, political stability or risk, labor costs, trade costs, investment costs, trade deficit, human capital, exchange rate, market size and potential, tax, inflation, budget deficit, domestic investment, external debt, government consumption and energy use (Bloningen 2005) [15]. Thus, a well-established economic environment is more likely to attract foreign businesses, leading to FDI inflows (Kumar 2002) [16]. There exists a positive relationship between FDI and institutional quality, physical infrastructure, import tariffs, macroeconomic stability and political stability (Trevino et al. 2002) [17]. Furthermore, the economic growth of a host nation acts positively on FDI inflows (Trevino et al. 2002 [17]; Grosse and Trevino 1996 [18]). Dunning (1993) [19] argues that rent seeking, market seeking, efficiency seeking and strategic-asset are motivating factors of FDI inflows. More specifically "rent-seeking" motivation involves foreign firms seeking cheaper factors of production and inputs of production such as primary goods. "Market seeking" FDI motive involves foreign firms exporting or opening new markets in host countries in order to increase sales. This is an alternative for businesses to face trade restrictions like high transport costs and rules of origin. The "efficiency seeking" companies want to use a small number of countries to serve larger markets. Some important factors in this motive are location, government regulation and endowments. Finally the "strategic-asset" motive is related to maintaining foreign firms' international position and competitiveness. Theoretically, trade restrictions or openness could affect FDI inflows positively or negatively. Some policies on trade openness might produce a significant impact in attracting FDI. For example, through the implementation of free trade agreements (FTA), several Latin American countries have been able to attract greater flows of foreign direct investment. Goldberg and Klein (1998) [20] suggest that FDI fosters exports, import substitution, or greater trade in intermediary inputs. On the other hand, Raff (2004) [21] argues that under certain conditions, a FTA does not lead to FDI, even though FDI would be welfare improving. This may happen, because equilibrium external tariffs are too low to induce FDI or because there are multiple equilibria and countries are stuck in one that does not support FDI. There are studies which have found a positive relationship between trade openness and FDI flows (see Biglaiser and DeRouen 2006 [22]; Chakrabarti 2001 [23]). On the other hand, it was found a negative relationship between FDI inflows and the degree of openness for countries in transition (Seim, 2009) [24]. In other words, the relationship between trade openness and FDI inflows is very complex, and needs therefore a careful explanation and may depend on the characteristics of each case. Theoretically, the effect of trade openness on the inflow of FDI varies according to the motivation for engaging in FDI activities (Markusen and Maskus 2002 [25]; Dunning 1993 [19]). More recent studies stressed the negative effect of trade openness on CEMAC countries' fiscal space (Ekouala, 2022) [26] as well as the swelling effect trade openness have on public debt (Ekouala, 2022) [27].

The debate regarding the development of Africa has devoted considerable attention to the role of international resource inflows, particularly the role played by foreign direct investment and their potential contribution to promoting economic growth and progress towards the development of African countries (UNECA, 2006) [28]. There is evidence on a rise of FDI trend in African countries (Ndikumana, 2003 [29]; UNECA, 2006 [28]). This recent trend of FDI in Africa raises two main issues.

Firstly, although the substantial size of the FDI volume in Africa since the 1990s; African financial globalization remains largely marginalized. For instance, in 2015 the share of Africa in the world FDI flows was about 3.1%, which is still less than half of the share reached in the 1970s. Thus, even if the main objective consists of attracting more FDI in Africa, the first challenge is how to make African countries more attractive to foreign investors.

Secondly, despite the intensification in private capital inflows, these resources have not shown any evidence of a significant impact on the economic development of African countries. Therefore, another challenge is how to surge the developing impact of FDI in Sub-Saharan African economies.

Previous studies have emphasized the importance of FDI for the economic development in developing countries or the role played by trade openness to attract FDI and to trigger the economic growth. But there are no enough studies investigating the role of trade openness channels to boost the domestic investment in sub-Saharan Africa. The aim of this paper is to contribute to that literature; the research states the hypothesis that trade openness is a significant factor affecting positively domestic investment in Africa. The rest of the paper is structured as follows: The next section presents data and methodology. Section 3 highlights the empirical results and discussion. Section 4 concludes.

## 2. Data and Methodology

## 2.1. Data

Our data are sourced from the World Bank and the African Development Bank. The study covers 19 Sub-Saharan African countries (Angola, Botswana, Burundi, Cameroon, the Central African Republic, Chad, Congo, Equatorial Guinea, Ethiopia, Gabon, Kenya, Madagascar, Mauritius, Mozambique, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe) over the study period 1980-2020.

**Table 1** summarizes the data used in this chapter. Where gross fixed capital formation (GFCF) is the proxy of the domestic investment, GDP is the per capita gross domestic product, expenditure refers to the government total expenditure, pop-growth is the population growth, industry represents the size of the industry sector, trade stands for the trade openness, fin-index represents the financial development index constructed based on the principal component analysis (PCA) of 4 mains variables: the domestic credit, the monetary credit, the bank liquidity, and the claims on government.

## 2.2. Data and Stylized Facts

The data show evidence of a positive relationship between trade and domestic investment in our study period except from Zambia where a negative relationship is highlighted between the two variables. This can be explained by the missing data of domestic investment. In fact, globally, a positive linkage is observed in our data. This is the case of Angola, Botswana, Cameroon, Chad, Congo, Equatorial Guinea, Gabon, Kenya, Madagascar, Mauritius, South Africa, Tanzania, Uganda, and Zimbabwe where the trend of the domestic investment is sensitive to the one trade growth (Figure 1). However, for the case of Burundi, the Central African Republic, and Mozambique there is some period where the positive relationship between the domestic investment and trade are disconnected with a period of a negative relationship for Mozambique after 2016. Besides, the missing data observed in our dataset for the case of Ethiopia and Zambia does not allow us to conduct a pertinent analysis of the relationship in these two countries. Finally, the FDI seems to have a steady trend in all the 19 countries and not that far from zero; this is displaying the weak level of foreign direct investment in Sub-Saharan Africa.

## 2.3. Estimation Strategy

To investigate the impact of trade on domestic investment in East, Central and Southern Africa, we first use as baseline model the pooled OLS and fixed effects with robust standards errors and assuming an AR(1) disturbances. Where lagged trade, lagged trade square, lagged trade cubic, lagged domestic investment, FDI, and the combined effect trade-FDI are taken as independent variables. Further, we estimated the fixed effects with country specific effect<sup>1</sup> assuming AR(1) disturbances and adjusted for autocorrelation, and finally, we used the random effects with instrumental variables and the GMM to deal with endogeneity issues in our data.

Variable	Obs	Mean	Std. Dev.	Min	Max
GFCF	645	7.32071	19.58623	-65.6894	231.932
GDP	762	1.423265	8.623901	-47.5032	140.367
expenditure	646	14.75707	5.330829	2.04712	35.3508
pop_growth	779	2.170732	1.068534	-6	8
industry	779	30.21694	16.75302	8	95
trade	667	65.67789	31.75075	19.2897	156.862
fin_index	340	-2.14E-08	1.522683	-3.55511	6.4543
lnxdebt	765	21.74906	1.274542	17.5997	24.9322
lnfdi	692	18.30563	2.522227	2.30258	23.2007

Table 1. Summary statistics.





<sup>1</sup>The country effect includes as well the interaction effects between trade and country specific effect

#### 2.3.1. Model 1

In this model both OLS and fixed effect assume robust standard errors and an AR(1) for the FE

$$DI_{it} = \alpha_{it} + \beta_1 DI_{it-1} + \beta_2 trade_{it-1} + \beta_3 trade\_square_{it-1} + \beta_4 trade\_cubic_{it-1} + \beta_5 FDI_{it-1} + \beta_6 Combinedtrade\_FDI_{it} + \varepsilon_{it}$$
(1)

where the dependent variable  $DI_{it}$  is domestic investment captured by the gross fixed capital formation,  $trade_{it-1}$ , represents the effect of the lagged trade,  $trade\_square_{it-1}$ , refers to the effect of the lagged trade square ,  $trade\_cubic_{it-1}$ , captures the effect of the lagged trade cubic,  $FDI_{it-1}$  refers to the effect of the lagged FDI,  $Combinedtrade\_FDI_{it}$  represents the interaction effect of trade and FDI on domestic investment, and  $\varepsilon_{it}$  is the robust errors terms.

#### 2.3.2. Model 2

In this model, the fixed effects assumes the AR(1) disturbances and is adjusted for autocorrelation.

$$DI_{it} = \alpha_{it} + \beta_1 DI_{it-1} + \beta_2 trade_{it-1} + \beta_3 trade\_square_{it-1} + \beta_4 trade\_cubic_{it-1} + \beta_5 FDI_{it-1} + \beta_6 Combined trade\_FDI_{it} + \beta_7 country FE_{it} + \varepsilon_{it}$$
(2)

where,  $CountryFE_{it}$ , represents the combined effect of the country fixed effect and trade, the others variables remaining as described in model 1.

#### 2.3.3. Model 3

This model uses the lag of GDP and FDI as instrumental variables to control the endogeneity issue in the data.

$$DI_{it} = \alpha_{it} + \beta_1 DI_{it-1} + \beta_2 trade_{it-1} + \beta_3 trade\_square_{it-1} + \beta_4 trade\_cubic_{it-1} + \beta_5 logFDI_{it} + \beta_6 Combinedtrade\_FDI_{it} + \beta_7 controlVar_{it} + \varepsilon_{it}$$
(3)

where,  $\beta_5 logFDI_{ii}$  capturing the effect of logFDI, *controlVar<sub>ii</sub>*, represents the set of control variables such as GDP per capita, expenditure, domestic credit, population growth, industry, and external debt, others variables remaining as described in model 1.

### 3. Results and Discussion

**Table 2** gives the empirical results of the impact of trade on domestic investment in Sub-Saharan Africa. First of all, it can be observed that previous level of domestic investment matters in determining the current level of domestic investment. While considering a bivariate relationship between trade and domestic investment the empirical findings give evidence of positive impact of trade on domestic investment at a low and very high level of trade. However, at a middle level the effect seems to be negative and all the results are statistically significant. This infers that a trade openness characterized by an increase in exports will have a crowding in effect on domestic investment in Sub-Saharan Africa *i.e.* the domestic investment will increase at any rise in the level of trade while a trade openness categorized with more imports will first increase the domestic investment at any increase of imports before having an opposite effect later on

	(OLS)	(FE)
VARIABLES	di	di
lagdi	0.0401	0.134***
	(0.103)	(0.0446)
lagtrade	0.945**	1.010**
	(0.402)	(0.453)
lagtrade_square	-0.0194***	-0.0244***
	(0.00578)	(0.00642)
lagtrade_cubic	7.70e-05***	0.000106***
	(2.46e-05)	(2.66e-05)
lagfdi	-1.264**	-1.263***
	(0.502)	(0.462)
Combined effect trade-FDI	0.0258***	0.0301***
	(0.00669)	(0.00464)
Constant	0.868	2.515
	(12.49)	(12.44)
Observations	513	494
R-squared	0.084	
Number of country		19

Table 2. Empirical results of trade effect on domestic investment.

Source: current research. Robust standard errors in parentheses \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

(crowding out effect). This positive impact of trade openness in East, Central, and Southern Africa is confirmed by the combined effect trade-FDI through the positive and statistically significant impact of their estimate. However, while considering the effect of FDI separately it seems to be negative with regards to the trade channel. Besides, the results in Table 3 conform globally to the one of our baseline model highlighting the importance of trade openness in Africa. These results confirm previous literature (Wilson & Purushothaman, 2003 [1]; ANECA, 2006; Fetahi-Vehapi et al., 2015 [3]; Raghutla et al., 2018 [2]) and particularly the neoclassical theory where the role of trade openness in improving economic growth was already stressed. Moreover, while looking at the country specific effect, the study suggests evidence of a positive and statistically significant specific effect associated with thirteen (13) countries out of the nineteen (19) namely: Angola, Botswana, Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea, Gabon, Kenya, Madagascar, Mauritius, Mozambique, and Zimbabwe. Five other countries highlight as well a positive specific effect but the results are not significant (Burundi, Ethiopia, South Africa, Tanzania, and Uganda) while solely Zambia displays a negative specific effect, however, the result is not statistically significant and this negative impact could be explained by the missing data related to the domestic investment data in our study period. Furthermore, the results of the Random effect with instrumental variables and the GMM in **Table 4** are globally conforming to our baseline model. Additionally, the control variables display (expenditure, domestic credit, population, industry, and external debt) globally a negative effect on domestic investment but the results are not statistically significant except from part of domestic credit and population results. This infers that the weak development of the credit sector in Africa does not encourage the domestic investment same for the size of population that does not improve the domestic investment. This last result could be explained by the fact that the biggest part of the African population is not a qualified labor force therefore their impact on domestic investment tends to be negative.

	(OLS)	(FE)	(FE)
VARIABLES	di	di	di
lagdi	0.0401	0.134***	0.0544
	(0.103)	(0.0446)	(0.0436)
lagtrade	0.945**	1.010**	0.628
	(0.402)	(0.453)	(0.543)
lagtrade_square	-0.0194***	-0.0244***	-0.0188***
	(0.00578)	(0.00642)	(0.00705)
lagtrade_cubic	7.70e-05***	0.000106***	8.11e-05***
	(2.46e-05)	(2.66e-05)	(2.83e-05)
lagfdi	-1.264**	-1.263***	0.0644
	(0.502)	(0.462)	(0.490)
Angola			1.037***
			(0.260)
Botswana			0.684***
			(0.210)
Burundi			0.295
			(0.504)
Cameroon			0.852***
			(0.309)
The Central African Rep.			1.190***
			(0.321)
Chad			0.901***
			(0.183)

 Table 3. Regression results of the effect of trade on domestic investment assuming country specific effect.

Continued			
Congo			0.548***
			(0.148)
Equatorial Guinea			2.284***
			(0.431)
Ethiopia			1.116
			(1.103)
Gabon			0.492**
			(0.246)
Kenya			0.635**
			(0.300)
Madagascar			0.589**
			(0.233)
Mauritius			0.664***
			(0.201)
Mozambique			0.603***
			(0.166)
South Africa			0.170
			(0.276)
Tanzania			0.169
			(0.285)
Uganda			0.588
			(0.425)
Zambia			-0.693
			(1.561)
Zimbabwe			0.499***
			(0.184)
Trade-FDI combined effect	0.0258***	0.0301***	
	(0.00669)	(0.00464)	
Constant	0.868	2.515	-19.52
	(12.49)	(12.44)	(12.91)
Observetiens	512	40.4	525
Degraria	515	474	525
K-squared	0.084	10	10
Number of country		19	19

Source: current research. Robust standard errors in parentheses \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1. The country fixed effect includes the combined effect of trade and country's specific effect.

	(OLS)	(FE)	(RE-IV)	(GMM)
VARIABLES	di	di	di	di
gdp	1.209***	1.311***	-1.965	-1.965
	(0.213)	(0.192)	(5.211)	(4.196)
lagdi	-0.0331	-0.0833*	0.0834	0.0834
	(0.104)	(0.0446)	(0.109)	(0.0996)
lagtrade	0.917**	0.689	0.481	0.481
	(0.447)	(0.622)	(1.114)	(0.789)
lagtrade_square	-0.0187***	-0.0210**	-0.0142	-0.0142
	(0.00649)	(0.00849)	(0.0165)	(0.0111)
lagtrade_cubic	7.02e-05**	9.11e-05***	5.75e-05	5.75e-05
	(2.73e-05)	(3.46e-05)	(5.95e-05)	(4.17e-05)
logfdi	-1.984***	-1.386**	3.237	3.237
	(0.547)	(0.652)	(2.610)	(3.143)
expenditure	-0.0477	0.219	-0.511	-0.511
	(0.147)	(0.263)	(0.712)	(0.571)
domestic_credit	-0.159**	-0.154	-0.233*	-0.233
	(0.0749)	(0.111)	(0.139)	(0.154)
pop_growth	-2.211	-3.044*	-2.667*	-2.667
	(1.833)	(1.613)	(1.591)	(2.571)
industry	-0.0119	0.0628	-0.269	-0.269
	(0.0904)	(0.160)	(0.448)	(0.381)
lnxdebt	0.279	-0.599	-0.549	-0.549
	(0.835)	(1.680)	(3.117)	(3.108)
Trade-FDI combined effect	0.0311***	0.0333***	0.0381***	0.0381***
	(0.00735)	(0.00488)	(0.0129)	(0.0116)
Constant	11.09	29.36	49.11	49.11
	(21.54)	(38.79)	(55.68)	(66.31)
Observations	485	467	485	485
R-squared	0.199			
Number of country		18	18	

Table 4. Determinants of domestic investment with instrumental variables table.

Source: current research. Robust standard errors in parentheses \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

# 4. Conclusion

This paper aimed to study the impact of FDI on domestic investment in selected Sub-Saharan African countries based on the trade channel. The research uses panel data of 19 African countries covering the study period 1980-2020. To investigate the impact of trade on domestic investment in East, Central and Southern Africa, we first use as a baseline model the pooled OLS and fixed effects with robust standards errors and assuming an AR(1) disturbances. Further, we estimated the fixed effects with country specific effects assuming AR(1) disturbances and adjusted for autocorrelation, and finally, we used the random effects with instrumental variables and the GMM to deal with endogeneity issues in our data. The study shows evidence of the positive impact of trade openness on domestic investment in our study period. This result highlights the trade channel as a pertinent instrument to the domestic investment and economic growth of Africa and the result is confirmed by most of country specific effects. Regarding our control variables, the research concludes on the one hand, that the weak development of the credit sector in Africa does not encourage domestic investment and on the other hand, it is argued that the size of population does not improve domestic investment since a large part of the African population is not a qualified labor force, therefore, their impact on domestic investment tends to be negative.

# **Statements and Declarations**

The authors have no relevant financial or non-financial interests to disclose.

# **Data availability Statement**

The data that support the findings of this study are available in World Bank and African Development Bank to data sources:

https://databank.worldbank.org/source/world-development-indicators and https://dataportal.opendataforafrica.org/nbyenxf/afdb-socio-economic-database \_1960-2021?indicator=1000110-Production

# **Conflicts of Interest**

The authors declare no conflicts of interest.

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