Original Research Article

The nexus between Economic complexity and Foreign direct investment in Sub-Saharan Africa.

Abstract

This study seeks to explore the relationship between economic complexity and foreign direct investment in Sub-Saharan African countries from 1998 to 2019. Using the ordinary least square technique, the study reveal that economic complexity in a global sense is affected positively and significantly by Foreign Direct Investment (FDI) in this region. This result was reinforced through the use of fixed effects hypothesis estimations as well as quantile regression. The findings also suggest that Gross Domestic product (GDP), trade, urbanization and education contributes to the economic sophistication of economies in Sub-Saharan Africa. Hence, policies such as investment promotion, provision of credit facilities by financial institutions, product diversification, specialization, innovation and the practice of good governance should be implemented so as to boost FDI which will go a long way contributing to the economic complexity of these economies.

Keywords: economic complexity, foreign direct investment, ordinary least square, quantile regression, Sub-Saharan Africa, Trade.

JEL Classification : C10, F10, F21, O30, O55

1. Introduction

"Recent economic literature has shed new light on our understanding of the determinants of economic growth. One determinant; economic complexity, which is a proxy for economic growth, indicates the productive capabilities or productive knowledge that exists in a given economy's economic structure" (Hidalgo and Hausmann, 2009)[1]. "These productive capabilities are measured indirectly by looking at the mix of products that countries export. In other words, economic complexity is computed using information on the relative productive structures of different economies. Empirical evidence suggests that economic complexity can be used to anticipate future economic growth" (Hidalgo and Hausmann, 2009; Jarreau and Poncet, 2012; Coniglio et al., 2016; Chavez et al., 2017). "Some studies indicate that economic complexity does a better job than other variables at predicting economic growth, because it better captures the productive capacity embedded in an economy" (Fukuyama, 1996; Hidalgo, 2015). "The information on the productive structures of economies that is used to compute the economic complexity measure conveys more detail than the aggregate economic variables traditionally used for the same purpose"[2]. As discussed by Ricardo Hausmann and Cesar Hidalgo, productive capabilities are all the inputs, technologies and ideas that, in combination, determine the frontiers of what an economy can produce. Since measuring and comparing such diverse and complex productive capabilities is difficult, they propose using a proxy, called the Economic Complexity Index (ECI), which tries to measure capabilities indirectly by looking at the mix of products that countries export. It is assumed that productive capabilities determine the number and quality of products that a country can export. For example, if economies are like restaurants, then productive capabilities are all the stuff that is needed in the kitchen; so the Economic Complexity Index ranks the restaurants by comparing the menus, rather than by comparing the recipes, food and people behind the kitchen doors. The ECI is an algorithm such that restaurants that serve a more diverse and sophisticated menu are scored higher.

[1] Productive capabilities or productive knowledge encompass every single piece of expertise, know-how, skill, and so on required by an economy to enable it to produce a single product. For example, cars embody a whole set of productive capacities, such as mechanical engineering, metallurgy, electronics, design, human resource management, and marketing.

[2] Traditionally, economists have sought to explain future economic growth by taking into account all productive inputs that an economy possesses, such as the endowment of resources, human capital (average years of schooling, percentage of population with some level of education), physical capital (capital stock, public investment, etc.), infrastructure (communications, transportation, etc.), level of technology, quality of institutions, and rule of law

Given the evidence of the relationship between economic growth and economic complexity, we investigate if the latter is also correlated with the distribution of Foreign Direct Investment (FDI) flows in Sub-Saharan economies over the period 1998–2019. "An agreed framework definition of foreign direct investment (FDI) exists in the literature. That is, FDI is an investment made to acquire a lasting management interest (normally 10% of voting stock) in a business enterprise operating in an agreed framework definition of foreign direct investment (FDI) exists in the country other than that of the investor defined according to residency" (World Bank, 1996). "This is regarded as the free flow of capital across international borders. Economists tend to favor the free flow of capital across national borders because it allows capital to seek out the highest rate of return. Unrestricted capital flows may offer several advantages", as noted by Feldstein (2000). First, international flows of capital reduce the risk faced by owners of capital by allowing them to diversify their lending and investment. Second, the global integration of capital markets can contribute to the spread of best practices in corporate governance, accounting rules, and legal traditions. Third, the global mobility of capital limits the ability of governments to pursue bad policies.

In addition to these advantages, which in principle apply to all kinds of private capital inflows, Feldstein (2000) and Razin and Sadka (2021) note that "the gains to host countries from FDI can take several other forms; FDI allows the transfer of technology particularly in the form of new varieties of capital inputs that cannot be achieved through financial investments or trade in goods and services. FDI can also promote competition in the domestic input market. Again, recipients of FDI often gain employee training in the course of operating the new businesses, which contributes to human capital development in the host country".

It is a key element of globalization and fill development gaps between developing and developed nations by providing physical capital for domestic investment projects, preparing foreign currency through initial investment and subsequent export earnings and, finally, generating corporate tax revenues in the host country through additional economic activities.

"We believe that economic complexity is related to FDI given the empirical evidence of the positive correlation between economic growth and economic complexity internationally as previously mentioned, and the well-documented long-term relationship between economic growth and FDI. This effect occurs through factors such as the adoption of foreign technology and know-how (technology transfer), which occurs via the incorporation of new inputs and new technologies in the host economy (licensing agreements, imitation, and the introduction of new processes and products, etc.), the stimulation of physical capital accumulation,

improvements in human capital and institutions, and the creation of linkages between foreign and domestic firms". Studies that have documented this relationship at the international level include Balasubramanian et al. (1996), Weinhold and Nair-Reichert (2001), Jong (2003), Chowdhury and Mavrotas (2006), and Ericsson and Irandoust (2010)."

Economic complexity is generally correlated with the distribution of FDI flows because foreign investors prefer to place their resources in those economies with higher measures of complexity not only because they have more productive knowledge, but also, as Hartmann et al. (2017) point out, because higher levels of complexity are an indicator of social capital, the quality of institutions, and the ability of the population to create social and professional networks in the state they live in. Also, states with higher levels of economic complexity are generally more diverse economies specializing in more sophisticated economic activities. Therefore, these economies could be expected to provide superior (i.e., more profitable) and more diverse investment opportunities.

This article contributes to two strands of economic literature. Firstly, we add to the literature that investigates the determinants of economic sophistication and FDI attraction by documenting how the amount of productive capacity or knowledge (economic complexity) stimulates FDI inflows. Secondly, we contribute to the extensive literature on spillovers, specifically on FDI and economic complexity spillovers[3]. In an economy with firms engaged in more diverse economic activities and producing more sophisticated products, it is easier to create upstream and downstream linkages. Understanding these types of spillover effects matters for the design of public policy on FDI attraction. Since the creation of new products involves the use of both existing and new knowledge, the research question "what is the effect of the FDI on economic complexity?" naturally arises. This article aims to shed light on the aforementioned question as well as to bring the interesting methodology of economic complexity in the economics literature, which means that besides the direct positive effects on economic growth, FDI also has an indirect positive impact on the economic complexity. Surprisingly, the question of how economic complexity impacts foreign direct investment has received little attention especially for African countries. Therefore, light needs to be shed especially for Sub-Saharan African countries that are mostly emerging and attractive for foreign investors.

As main contribution of this research that fills the afford mentioned and identified gap in the literature, we use pooled OLS in baseline test, fixed effects and quintile analyses in robustness

[3] An additional advantage of using economic complexity rather than other macroeconomic variables when looking at spillover effects is that the issue of sample size is less important

test to find and confirm that economic complexity has a positive impact on foreign direct investment.

The organization of the rest of the study is as follows; second section present some related literatures on the topic, the third section shows the data, sources, model and estimation techniques while the fourth section reports the results of the study, followed by concluding remarks in the fifth section.

2. Related literature

To that which concerns the nexus between economic complexity and other socio-economic variables, two strands of the literature can be identified; i) studies that look at the link from economic complexity to other economic variables and ii) those that seek effects of other economic variables on economic complexity.

Regarding the first link, many studies have focused on growth effects of economic complexity from the early works of Hidalgo et al. (2009). Pernet (2015) studies "the entry of foreign firms into Chinese cities in the years 1998–2007. His results suggest that the economic complexity of a city is a key determinant of its ability to attract FDI flows". Javorcik et al. (2017) analyze "firm-product-level data from the Turkish economy for the period 2006–2009. Their results allow them to affirm that attracting inflows of FDI foster the upgrading of the productive structure in an emerging economy". Sadeghi et al (2020) examined **"**a cross country analysis of economic complexity, human capital, and FDI attraction**.** The results indicate that economic complexity is one of the main determinants of FDI inflow with statistically and economically robust positive effects on FDI inflows to host countries. Furthermore, results explain why countries with equal human capital endowment have different performances in FDI attraction"

In relation to the second kind of relationship that is, drivers of economic complexity, Blomstrom et al. (1994) report "a significant correlation between inflows of FDI as a percentage to GDP and the growth per capita GDP across all developed countries for the period 1960-1985. They suggest that although the gap in technology and productivity between foreign-owned firms and domestically-owned ones is larger in poorer countries than in richer ones, it does not necessarily mean that the poorer countries gain the most from inward FDI". The study argues that "the least developed countries may learn little from multinationals, because local firms are too far behind in their technological levels to be either imitators or suppliers to multinationals". The authors found empirical support for this supposition, in the sense that inflows of FDI were significant determinants of growth for the upper half of the distribution of countries, when ranked by per capita income, but not for the lower half.

Campos and Kinoshita (2002) in a study of the impact of FDI on economic growth in 25 Central and Eastern European and former Soviet Union transition economies between 1990 and 1998 found that FDI has a positive effect on economic growth. Bengoa and Sanchez-Robles (2002) in their study exploring empirically the interplay between Economic Freedom, growth and FDI, using panel data analysis on a sample of 18 Latin America countries over the period 1970-1999 found a positive effect of FDI on their growth. Also, they point out to the need of certain level of human capital.

Moudatsou (2003), analyses "the growth effects of foreign direct investment (FDI) in European Union (EU) countries using data over the period 1980-1996. He obtained estimates of the growth effects of FDI for each country in isolation and by pooling the data for the whole Union. Country-specific estimates suggested that growth determinants vary across EU members and that only past FDI inflows have a significant effect on growth. When data are pooled, the empirical results show that FDI has a positive effect on the growth rate of EU economies both directly and indirectly (through trade reinforcement). Also, unlike previous empirical findings concerning developing economies, he obtained evidence that the growth effect of FDI is not conditional upon the level of human capital in developed host countries".

Bouchoucha and Ali (2019) examines "the impact of foreign direct investment on economic growth in Tunisia using time series data for the period 1980-2015. The study used the ARDL (Autoregressive Lag Distribution) approach to study the short-run and long-run relationship between Foreign Direct Investment and economic growth. The empirical results show that FDI has positive impact on economic growth in both the short and the long run".

Khan et al (2020) applied "the ARDL and VECM approaches in studying the causal nexus between economic complexity and FDI in China. The study confirms the long-run bidirectional and short-run unidirectional causal relationship between economic complexity and foreign direct investment". Ozsoy et al (2021) investigates "whether inflows of FDI and innovative activities act as a channel of knowledge spillovers in improving quality of countries' output. Utilizing panel data of countries for the period 2002–2015 and applying GMM methodology, the results indicate that the level of financial development, the quality of human capital and globalization of a country have a determinant role on the relation between knowledge spillover channels and the quality of exports. Patent applications generally positively affect sophistication of exports. FDI serves as a channel for knowledge spillovers to benefit the sophistication level of exports only for developed, more educated, financially developed and globalized countries".

Our study contributes to the literature by showing the importance of FDI flows as an important factor explaining economic complexity in SSA Countries. Moreover, as far as we know, our study is the first that examines the growth of economic complexity from the look of FDI.

3. Methodology

3.1 Data, source and measurements

As shown in **Table 1**, Data for macroeconomic variables are extracted from World Development Indicators (2022). The economic complexity variable is a composite index with nine (9) dimensions, i.e. eight (8) variables on exports: exports of goods and services, exports of ICT goods, exports of high-tech goods, food exports, fuel exports, manufactured goods exports, agricultural materials exports, metals and minerals exports and a variable representing GDP/capita. The sample includes 36 SSA countries (see the list in the **Appendix**). These countries were chosen according to data availability and the study period used goes from 1998 to 2019.

Table 1: Definition and source of Variables

Variable	Definition	Source
ECI	Economic Complexity Index	Atlas of Economic complexity (2021)
FDI	Foreign direct investment, net inflows (% GDP)	WDI Data Base (2021)
GDP	Gross Domestic Product per capita (current US$)	WDI Data Base (2021)
TRADE	Trade (% of GDP)	WDI Data Base (2021)
GovtSE	Government expenditure on education, total (% of GDP)	WDI Data Base (2021)
GFCF	Gross fixed capital formation (current US$)	WDI Data Base (2021)
Urbanization	Urban population (% Total Population)	WDI Data Base (2021)
Imports	Imports of goods and services (% of GDP)	WDI Data Base (2021)
Cons cap	Fixed capital consumption	WDI Data Base (2021)

Source: *Authors computation*

The summary of the descriptive statistics in **Table 2** below shows the number of observations for all variables in a panel of 36 SSA countries for a period of 22 years, i.e. 1998 - 2019. During this period, the average index of economic complexity was 5.20 with a minimum and a maximum of 0.29 and 65.22 respectively while foreign direct investment and gross domestic product which constitute the main independent variables had as average 3.85 and 2.96 for a minimum of -8.70, 2.05 and a maximum of 57.84 and 4.21 respectively. The variable

government spending on education varies from -3.47 to 39.57 for an average of 15.87. The other control variables all shows positive variations during the period 1998-2019 in SSA.

Table 2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ECI	792	5.204	7.722	.288	65.218
FDI	792	3.848	5.725	-8.703	57.838
lnGDP	792	2.964	.441	2.049	4.21
TRADE	792	65.687	35.019	1.219	225.023
GFCF	792	22.307	9.877	2	81.021
GovtSE	792	15.869	5.974	-3.474	39.566
Imports	792	37.559	20.148	.588	117.154
Urbanisation	792	39.033	17.196	7.83	89.741
LnCons cap	792	20.434	1.699	15.835	24.912

Source: *Authors computation using Stata*

In order to verify the correlation between the variables, we produced a correlation matrix (see **Table 3**).

Table 3: Matrix of correlations

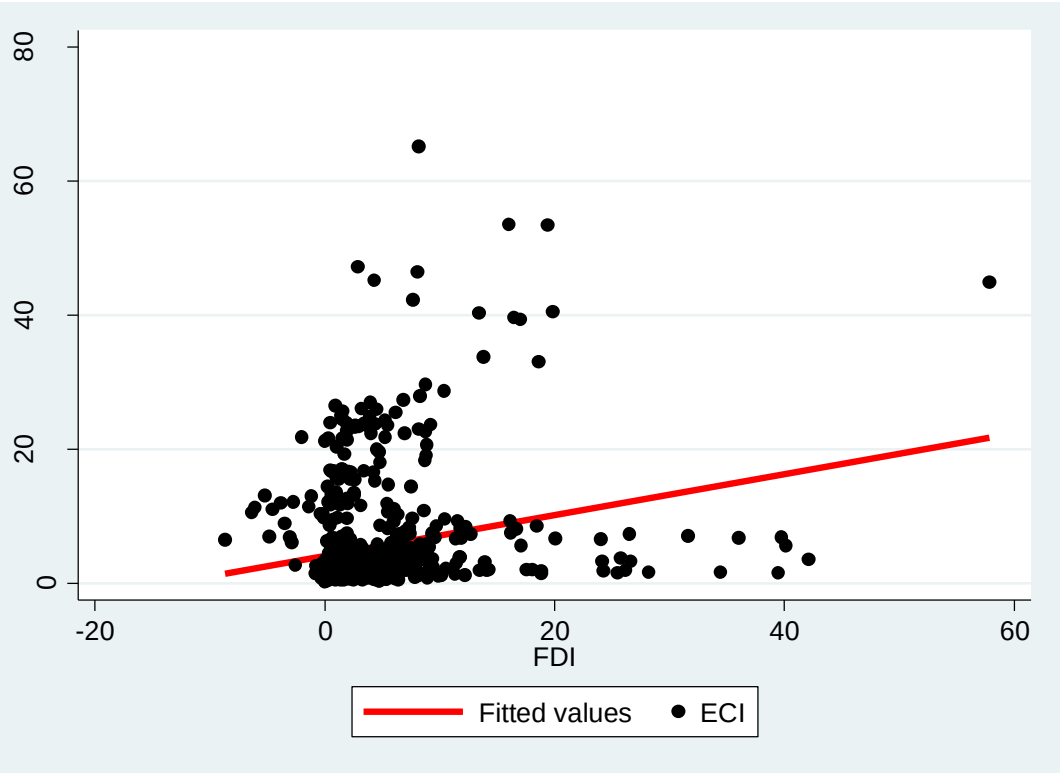
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) ECI	1.000								
(2) FDI	0.227	1.000							
(3) lnGDP	0.803	0.175	1.000						
(4) TRADE	0.585	0.419	0.456	1.000					
(5) GFCF	0.326	0.358	0.379	0.440	1.000				
(6) GovtSE	-0.170	-0.077	-0.072	-0.083	-0.016	1.000			
(7) Imports	0.391	0.397	0.268	0.924	0.440	0.019	1.000		
(8)Urbanisation	0.590	0.211	0.765	0.362	0.254	-0.203	0.136	1.000	
(9)LnCons_cap	0.133	-0.083	0.377	-0.130	0.163	0.086	-0.260	0.183	1.000

Source: *Authors computation using Stata*

The correlation matrix in this study aims to verify if there is any relationship between the pairs of independent variables indicating the presence of multi-collinearity. The results reveal a weak relationship between economic complexity and FDI as well as with all other variables. Positive relationship can be seen between the pairs GDP per capita and control variables

except government spending on education. However, these relationships are not very strong, which allows us to affirm the absence of multi-collinearity between the independent variables. Figure 1 below, plot the economic complexity index against the FDI inflow to GDP measured in percentage. The graph suggest a positive relationship between these variables.

Figure 1: Foreign direct investment against economic complexity



3.2 The Empirical Model

The model for this study is inspired by the work of Ozsoy et al (2021) who investigates using GMM methodology whether inflows of FDI and innovative activities act as a channel of knowledge spillovers in improving quality of countries' output. The model is therefore given by equation (1) below:

$$ECI_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 GDP_{it} + \beta_j X_{it} + \varepsilon_{it} \qquad (1)$$

Where ECI is the economic complexity index, an index developed by Hidalgo and Hausmann (2009), based on the level of export diversification and on the average ubiquity of the products that the country exports. FDI representing foreign direct investment, GDP represent the Gross domestic product per head and X stands for the vector of control variables, made up of trade, government spending on education, gross fixed capital formation, importation of

goods and services, the rate of urbanization, and the log of fixed capital consumption. Ɛit represent the error terms which captures all information not explained by our model with i and t providing information on countries and time.

3.3 Estimation procedure

The choice of variables and regression was determined from the approach of Ozsoy et al (2021). In our approach, we initially use pooled OLS estimations, then proceed to the Eicker White test which revealed that the hypothesis of the presence of fixed effects could not be rejected and therefore the "Within" estimator is adopted for our model. Therefore, as robustness tests, we adopt the generalized least squares fixed effect hypothesis with successive addition of control variables to highlight the relationship between economic complexity and FDI in SSA as well as quintile regressions.

4. Empirical Results

4.1 The effect of FDI on economic complexity under pooled OLS estimation

To measure the effects of FDI on sophistication level of countries' exports, we first run the pooled OLS regressions. The baseline results of the pooled OLS estimates shown in **Table 4** display the first column showing the relationship between economic complexity, FDI and gross domestic product per head, while Column [2-7] shows this relationship with successive addition of control variables. The results indicates that all coefficients are statistically significant at 5% level. In fact, FDI has a positive and significant influence on economic complexity. Thus, the 1% increase in the FDI growth rate leads to an increase in economic complexity of 0.12%. The addition of control variables as from column 2 shows that government spending on education is equally positively and statistically significant throughout. This is in light with the results of Borensztein et al. (1998) showing that education plays a positive and significant role on economic sophistication. The positive sign here indicates that as more is invested in the educational sector, it goes a long way improving on the human capital which in turn ameliorates the economic structures. In addition, we find that the coefficients of fixed capital consumption are negative and statistically significant, so a 1% increase in the rate of fixed capital consumption reduces economic complexity by 0.87%. Trade and urbanization rate both display a positive impact on economic sophistication. An increase in the rate of trade and urbanization by 1% leads to an increase in economic sophistication by 0.054% and 0.053% respectively.

In a general view we observe that foreign direct investment account greatly and positively to the economic complexity of SSA economies. Our results are coherent with the works of Lipsey and Zejan, (1994) and Ozsoy et al (2021) who find that FDI impact positively on output and technological productivity. The results are equally similar to those obtained by Moudatsou (2003); Bouchoucha and Ali (2019) and Khan et al (2020) which indicates that FDI has a positive contribution to economic growth and economic complexity.

Table 4: Baseline results with independent and control variables.

	Dependent variable : Economic complexity index						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
FDI	0.120***	0.110***	0.121***	0.125***	0.0857***	0.0082*	0.0125*
	(0.0288)	(0.0284)	(0.0283)	(0.0300)	(0.0290)	(0.0285)	(0.0268)
lnGDP	13.79***	13.68***	15.23***	15.30***	17.09***	14.92***	15.00***
	(0.374)	(0.369)	(0.564)	(0.592)	(0.601)	(0.609)	(0.572)
GovtSE		0.139***	0.161***	0.161***	0.143***	0.139***	0.0815***
		(0.0268)	(0.0273)	(0.0274)	(0.0262)	(0.0247)	(0.0239)
Urbanisation			0.0535***	0.0541***	0.0709***	0.0624***	0.118***
			(0.0148)	(0.0149)	(0.0143)	(0.0136)	(0.0139)
GFCF				-0.00743	0.00256	-0.0431**	0.00331
				(0.0184)	(0.0176)	(0.0173)	(0.0168)
LnCons_cap					-0.871***	-0.509***	-0.869***
					(0.0993)	(0.101)	(0.101)
TRADE						0.0541***	0.185***
						(0.00549)	(0.0137)
Imports							-0.241***
							(0.0236)
Constant	36.14***	33.55***	35.76***	35.80***	23.01***	26.61***	18.77***
	(1.107)	(1.198)	(1.336)	(1.340)	(1.940)	(1.867)	(1.914)
Observations	792	792	792	792	792	792	792
R-squared	0.652	0.663	0.669	0.669	0.698	0.732	0.763

Source: *Authors computation using Stata*. Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

4.2 Post-estimation analysis: Fixed effects hypothesis and non-parametric test

Here, we apply the fixed effect hypothesis in examining the relationship between economic complexity and FDI. Just as our baseline results, FDI still show positive and significant contribution under the fixed effect hypothesis, though with significance level varying form 5% to 10% as shown in **table 5** below. The impact fluctuates with successive addition of control variables. The variable government spending on education postulate a positive and significant sign. This variable is regarded in this study as a proxy for human capital. Therefore, and improvement in educational quality will go a long way ameliorating the economic complexity of economies. The variable urbanization rate and trade respectively display the same effects as with the baseline results under pooled OLS. Once more, our results corroborate with those of Moudatsou (2003); Bouchoucha and Ali (2019) and Khan et al (2020)

Table 5: Sensitivity analysis with control variables under fixed effects hypothesis

	Dependent variable : Economic complexity index					
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
FDI	0.0311**	0.0328*	0.0284**	0.0287*	0.0256*	0.0208*
	(0.0171)	(0.0173)	(0.0169)	(0.0169)	(0.0169)	(0.0164)
lnGDP	5.040***	4.983***	2.173***	2.351***	2.616***	1.934**
	(0.389)	(0.400)	(0.582)	(0.878)	(0.884)	(0.862)
TRADE	0.0389***	0.0383***	0.0346***	0.0346***	0.0340***	0.114***
	(0.00593)	(0.00603)	(0.00590)	(0.00590)	(0.00589)	(0.0126)
GFCF		0.00742	0.01000	0.0107	0.0121	0.0681***
		(0.0125)	(0.0121)	(0.0124)	(0.0124)	(0.0144)
Urbanisation			0.209***	0.212***	0.208***	0.228***
			(0.0322)	(0.0342)	(0.0342)	(0.0332)
LnCons_cap				-0.0715	-0.128	-0.0554
				(0.263)	(0.264)	(0.256)
GovtSE					0.0373**	0.0402**
					(0.0171)	(0.0166)
Imports						-0.163***
						(0.0230)
Constant	12.17***	12.12***	11.79***	11.00***	9.876***	10.47***
	(1.226)	(1.229)	(1.198)	(3.154)	(3.188)	(3.089)
Observations	792	792	792	792	792	792
R-squared	0.214	0.214	0.256	0.256	0.261	0.308
Number of ID	36	36	36	36	36	36

Source: *Authors computation using Stata* Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The quintile analysis presented in **table 6** below provides the evidence about the marginal effects in each quintile. The sign of FDI coefficient is positive and significant at 5% level at all quintiles respectively. The results we obtained suggest that FDI, GDP, importations and government spending on education significantly affect economic complexity. Gross fixed capital formation shows significance only at the 25th quintile, while the rate of urbanization and consumption of fixed capital are significant only at the 75th quintile, with alternating effects respectively. The results obtained using this regression, are not really different from our baseline results, therefore our model is consistent.

Table 6: Robustness with the use of quintile regressions

VARIABLES	(1) Quintile 25	(2) Quintile 50	(3) Quintile 75
FDI	0.0152**	0.0099**	0.017**
	(0.00851)	(0.0181)	(0.0551)
lnGDP	4.981***	6.287***	12.47***
	(0.182)	(0.387)	(1.175)
TRADE	0.0606***	0.0926***	0.243***
	(0.00437)	(0.00931)	(0.0282)
GFCF	0.0145***	0.0179	0.00503
	(0.00535)	(0.0114)	(0.0346)
GovtSE	0.0458***	0.0391**	0.0951*
	(0.00760)	(0.0162)	(0.0491)
Imports	-0.0784***	-0.125***	-0.326***
	(0.00750)	(0.0160)	(0.0485)
Urbanisation	0.00668	0.00252	0.0933***
	(0.00440)	(0.00938)	(0.0285)
LnCons_cap	-0.0282	-0.105	-0.483**
	(0.0321)	(0.0683)	(0.207)
Constant	11.94***	13.67***	18.71***
	(0.608)	(1.296)	(3.933)
Observations	792	792	792

Source: *Authors computation using Stata* Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5 Conclusion

The study seeks to explore the relationship between economic complexity and foreign direct investment in Sub-Saharan African countries. The findings of the study reveal that the economic complexity of these economies in a global sense is affected positively and significantly by FDI. This result was reinforced through the use of fixed effects hypothesis estimations as well as quintile regression. Under robustness check. The findings also suggest that GDP, trade, urbanization and education contributes to the economic sophistication of economies in Sub Saharan Africa. Previous studies mostly discussed the impact of FDI on economic growth, trade, etc., but ignored its effect on economic complexity and as such, there is a lack of literature on the effect of foreign direct investment on economic complexity. This research is an endeavor to fill the gap by analyzing the mutual relationship between economic complexity and foreign direct investment.

FDI produces knowledge and specifically knowledge externalities which is transferred to host countries. Based on our results, the study puts forward several policy implications.

Firstly, given the positive contribution of FDI to economic sophistication and the fact that there is transfer of knowledge through these interactions, Sub-Saharan economies should promote these interactions (Investment Promotion) by adopting suitable interest rates which will draw foreign investors in the economy. Also, financial institutions equally have a great role to play in promoting FDI by providing investors with access to credit, helping firms to start doing business especially with multinationals and thus contributing to development programs thereby impacting on economic complexity as shown by our results.

Moreover, to enhance the FDI inflow, there is need to diversify, specialized, improved product mix by the arrangement of good practices such as good governance, good institution quality, better infrastructure, R&D, innovation, and the implementation of intellectual property rights protection acts. The improved institutional arrangements will likely attract more FDI which in turn will contribute to the economic complexity of Sub-Saharan economies.

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Appendix

Table 7: Sample of Sub-Saharan African Countries

Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo-Verde, Cameroon, Central African Republic, Comoros, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast,

Kenya, Lesotho, Madagascar, Malawi, Mali, Mozambique, Niger, Nigeria, Republic of Congo, Rwanda, Sao Tome and Principe, Senegal, Seychelles, South Africa, Sudan, Tanzania, Togo, Uganda, Zambia and Zimbabwe.

Source : Authors