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Impact of foreign direct investment on manufacturing sector growth in sub-Saharan Africa

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Abstract

This study explores the influence of Foreign Direct Investment (FDI) on the growth trajectory of the manufacturing sector in Sub-Saharan Africa. The research employs the panel Autoregressive Distributed Lag (ARDL) estimation technique on data spanning from 1985 to 2021. The findings reveal that FDI and TOP positively impact the manufacturing sector's growth in the long run, while GFCF exerts a negative influence. However, these effects are not observed in the short run. The study underscores the need for policies that enhance the investment climate and foster trade openness to stimulate manufacturing sector growth. The adverse impact of GFCF calls for additional research to uncover the underlying causes and propose potential remedial measures. This study offers critical insights for policy formulation and paves the way for future research in economic development in Sub-Saharan Africa.

Keywords: Foreign direct investment; Manufacturing sector; ARDL; Capital formation; Africa

1. Introduction

Manufacturing sector in Sub-Sahara African (SSA) countries have experienced slow growth pattern over the years as a result of deindustrialization occasioned by high resource gap and inadequate Foreign Direct Investment (FDI) flow in the region. Sequel to global economic recession of 1980s induced by decline in oil prices, SSA countries started a reform with the view to finding solution to the low industrial growth, an attempt which was far from being successful. Lack of industrialization occasioned by high resource gap and inadequate foreign direct investment (FDI) flow in sub-Saharan African were seen as factors hindering manufacturing sector growth in developing countries. Though, Wako (2021) argue that FDI contributed to premature deindustrialization in SSA except where it is non-resource seeking, we are of the opinion that FDI; whether resource, efficiency or market seeking is an important factor in economic growth especially where FDI is manufacturing inclined - revealed by the growing share of employment in manufacturing industries. However, the argument that FDI enhances manufacturing sector growth is still ongoing. While there are few cross country (Alfaro, 2003; Azeroual, 2016) and country specific (Danmmola, Olateju & Aminu, 2017; Samal & Raju, 2016; Orji, Anthony-Ori, Nchege & Okafor, 2016) studies on the FDI and manufacturing sector growth relationship, we are yet to identify studies on the impact of FDI on manufacturing sector with the mix of explanatory variables such as domestic investment and exchange rate in SSA; thus confirming the existence of knowledge gaps for further studies. This study will fill the knowledge gap by assessing how these variables impact on manufacturing sector growth in SSA.

Recent studies (Clark, 2019; Black, Makundi & McLennan, 2017) show that inadequate industrial development hinders economic expansion and future growth outlooks in Africa. Amoah and Jehu-Appiah (2022) recognized the importance of developing industries through sustained effort is socially and economically important to most countries. Most sub-Sahara African countries describe their industrial sector to include manufacturing, energy, production, construction

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works, mining and quarry, Economic progress is linked to rising share of manufacturing output and export as most success story of inclusive development and competitiveness is linked to manufacturing supply chain. Africa is believed to be the next large manufacturing center world over. Countries like Nigeria, South Africa, Egypt, Morocco, Ethiopia, Rwanda, and others whom lately adopted policies facilitating manufacturing and industrial development (Signe, 2018) are likely to be among the manufacturing hub in Africa.

Growth in the manufacturing sector is the fastest way for Africa to reach the next stage of economic development and increase growth; hence, governments of SSA countries are searching for modern and dynamic means to attract FDI, and nurture manufacturing industries for diversified competitiveness and productivity spill-over through backward and forward linkages to other sectors for desired growth. The African Continental Free Trade Area (AfCFTA) arrangement launched in 2018 is expected to open manufacturing sector potentials and facilitate sustainable growth through intra-African trade.

Manufacturing sector in Africa lag behind compared to other regions. Evidence of manufacturing sector diffusion rate, with 16 SSA countries de-industrialized due to lack of manufacturing base diversification, non-production for export and low per capita income was shown by Clark, (2019). Moreover, the region's manufacturing value share in GDP underperformed (UNIDO, 2015). Mid 1980 witnessed manufacturing sector declined as a result of structural adjustment programmes forced on African countries by the IMF and World Bank (Clark, 2019), restrained commodity prices, low manufacturing domestic market, and macroeconomic fundamentals. However, as Africa is highly endowed in natural resources, the region's resource flow remains manufacturing-based since the motive of multinational companies' entry in Africa is resource-seeking.

The paper is divided into five parts. The first part is the introduction; we reviewed related literature in part two while the third part shows the methodology. Part four discusses the empirical results and part five concludes the work.

2. Literature Review

Manufacturing sector assumes an important position in development process of any economy, more so because of its role in provision of job than any other sector and spillover effect to other sectors (Tybout, 2000). While it is argued (Chen, Geiger & Fu, 2015) that manufacturing paves way for industrialization, FDI can facilitate manufacturing sector growth but the problem is that African countries are far from both attracting FDI and industrialization; an issue requiring structural changes to be manufacturing inclined and benefit from job creation, skill development, management ability and technical know-how that are necessary for economic growth. Research (Signe, 2018) show that presence of active manufacturing sector as an evidence of industrialization and development of the global economy is central to a continual decline of global economic difference. Gareth, Ewout and Morten (2017) affirm that sub-Saharan Africa per capita output in manufacturing is lowest in the planet; this view held that African countries have been unable to add-on to the output of other sectors through increased productivity by creating of employment in manufacturing industries with high value-addition. They noted that Sub-Saharan Africa need exceptional response of inclusive industrialization.

Amidst these argument, Chen, Geiger and Fu (2015) show that FDI flow in Africa has improved than in the past and varied through the operations of multi-national companies which could be market-seeking, resource-seeking and efficiency-seeking. According to him, in SSA, manufacturing FDI is market-seeking driven considering the size of African market and its potentials, in efficiency-seeking FDI, foreign investors take advantage of low cost made possible through sustainable environment and human resource development that improves cooperation within and between enterprises; while in resource seeking FDI, foreign investors take advantage of natural resources of host country. Though, these three types of FDI exist, generally, its growth impact is not pronounced in sub-Saharan Africa. However, manufacturing FDI remains prominent in nations growth as every success story and inclusive development is linked to manufacturing–supply chain. From 2010 -2013, manufacturing output in sub-Saharan Africa kept lingering between $ 142. 11 billion to $178.81, representing not more than 9.91% of GDP within the period. Unsteady increase occurred in 2014 and 2015 to $ 187.91 billion and $ 168.80 billion, representing 10.06% and 10.02% of GDP respectively, and dropped in 2017 to $ 167.46 billion which is 9.82% of GDP. However, a slight increase was observed from 2018 to 2021 to $183.58billion, 197.64b, $190.55b and 221.57b representing 10.60%, 11.03%, 11.17% and 11.55% of GDP respectively; almost unchanged.

From a theoretical evaluation, the link between FDI and growth relative to productivity is in common positive (Castejon and Woerz (2006). In the neo-classical theory, FDI increases the level of investment and productivity. This enhances capital accumulation and innovation, enhances the formation of fresh technology and firm's knowledge that will enhance manufacturing sector productivity because output is generated by using capital and labour in the neo-classical

growth function. This FDI-knowledge creation reduces the effect scarcity of capital and allows the host countries economy maintain long-run growth through external knowledge. So, FDI can positively affect manufacturing sector growth by improving total factor productivity through external knowledge and technological transfer.

Empirical assessment on FDI-manufacturing sector relationship show mix results. With data from 47 OECD countries Alfaro (2003) found that FDI has positive effect on manufacturing sector. In the same vein, Liu and Wang (2003) found positive benefits of FDI on total factor productivity in the industrial sectors in China in 1995. Demurger and Chen (2002) assessed the role of FDI in the productivity growth of Chinese manufacturing industries from 1988 to 1994, found a positive correlation between the productivity growth and the existence of foreign funds in the household goods industries. Meniago and Lartey (2020) found that low income countries do not have the capacity to absorb the technology spillover from FDI from advanced country unless there is high level of human capital development to absorb the new skill and methods.

Opaluwa, Ameh, Alabi and Mohammed (2012) found long-run relationship between FDI and manufacturing output. Through the 'contagion' and the 'concurrence' effect, according to Kokko, Chen and Tingvall (2011), local firms have profits from FDI but that these profits are incomparable with the level of external funding in Chinese industries. While the concurrence effect are in line with the level of productivity and complexity in technology of foreign firms, the outcome from the "contagion effect" strongly impacted both the foreign and local firms.

In the same vein, Okoli and Agu found that FDI has positive impact on manufacturing sector growth in the long-run. Blomstrom and Wolf (1994) examined if the impact of FDI on manufacturing firms in Mexico were high enough to help local firms to reach to a productivity level similar to that of American firms with data, from 1965 to 1982. Their findings reveal a significance positive impact of foreign investment in relation to local productivity growth rate.

The study of Samal and Raju (2016) reveal that FDI in manufacturing sector enhances economic growth. The study of Javorcik (2004), on the FDI impact on the productivity of Lithuanian industries reveal that the positive FDI-spillover resulting from vertical links among global firms and local businesses that are more beneficial and these spillovers originated from firms that are partly funded with foreign investments and not those wholly owned by foreigners.

Conversely, taking account of FDI from France, Spain and other countries, Azeroual (2016) examined the relationship between foreign direct investment and total factor productivity in Morocan manufacturing firms. Result show that FDI impacted differently on total factor productivity of manufacturing output; while FDI from France and other countries were found to be negative, that of Spain had weak-positive effect. Orji, et al (2015) found that FDI influenced manufacturing sector negatively while Aitken and Harrison (1999), found negative impact of FDI on firm's productivity.

3. Data and Methodology

The methodology employed in this study is the panel regression estimation technique. The data set was generated from the World Bank Development Indicator and covers a period from 1985 to 2021. The dependent variable is the manufacturing sector output (MVA), while the independent variable is foreign direct investment (FDI). The control variables include gross fixed capital formation (GFCF), trade openness (TOP), and the log of the exchange rate (InEXR). The model is represented in its linear form as follows:

$$MVA = \alpha i + \beta 1 FDIit + \beta 2 InEXRit + \beta 3 TOPit + \beta 4 GFCFit + \varepsilon it \qquad 1$$

Where,

MVA	=	manufacturing sector output
FDI	=	foreign direct investment flow
TOP	=	Trade openness
InEXR	=	log of exchange rate
GCFC	=	gross fixed capital formation
β_1-β_4	=	coefficients of independent variables
ε_{it}	=	error term

4. Results and Discussion

4.1. Unit root test

The results indicate that all variables are integrated of order one (I(1)), except for FDI, which is integrated of order zero (I(0)). This suggests that the variables, except for FDI, have unit roots and are non-stationary in their levels, but become stationary after differencing once. The significance of the unit root tests implies the importance of considering first differences in modeling these economic variables. Additionally, the high significance levels across multiple tests reinforce the robustness of the findings, providing a solid foundation for the adoption of Panel autoregressive distributed lag model as the preferred estimation approach.

Table 1 Panel Unit root test results

Variable	Levin, Lin & Chu t*	Breitung t-stat	Im, Pesaran and Shin W-stat	ADF - Fisher Chi-square	PP - Fisher Chi-square	Order of Integration
MVA	-10.2398***	-11.1076***	-12.6636***	318.175***	1237.75***	I(1)
FDI	-3.62156***	-2.05614**	-4.21340***	140.330***	263.369***	I(0)
InEXR	248.898	-2.79228***	-15.0684***	322.302***	403.503***	I(1)
TOP	-11.0819***	-7.82388***	-14.9593***	358.103***	1641.41***	I(1)
GFCF	-13.4284***	-12.2378***	-14.4239***	385.143***	1914.69***	I(1)

4.2. Descriptive Statistics

Table 2 Descriptive Statistics results

Statistics	MVA	FDI	INEXR	TOP	GFCF
Mean	10.59314	3.760125	1.906405	67.41668	21.36448
Maximum	33.34589	161.8238	9.827566	225.0231	93.54746
Minimum	0.232608	-34.20896	-8.620740	0.784631	-2.424358
Std. Dev.	5.024022	8.219216	1.385738	33.04521	9.589187
Observations	1098	1205	1197	1156	1106

The descriptive statistics of the variables in the study in Table 2 reveal that the Manufacturing Sector Output (MVA) has a mean of 10.59, a maximum of 33.35, a minimum of 0.23, and a standard deviation of 5.02 from 1098 observations. Foreign Direct Investment (FDI) has a mean of 3.76, a maximum of 161.82, a minimum of -34.21, and a standard deviation of 8.22 from 1205 observations. The log of Exchange Rate (INEXR) has a mean of 1.91, a maximum of 9.83, a minimum of -8.62, and a standard deviation of 1.39 from 1197 observations. Trade Openness (TOP) has a mean of 67.42, a maximum of 225.02, a minimum of 0.78, and a standard deviation of 33.05 from 1156 observations. Lastly, Gross Fixed Capital Formation (GFCF) has a mean of 21.36, a maximum of 93.55, a minimum of -2.42, and a standard deviation of 9.59 from 1106 observations. The presence of negative values for FDI and GFCF, as well as the large values for the exchange rate, suggest that further investigation may be needed to understand these variables better. Figure 1 further provids graphical details and trends of the model variables.

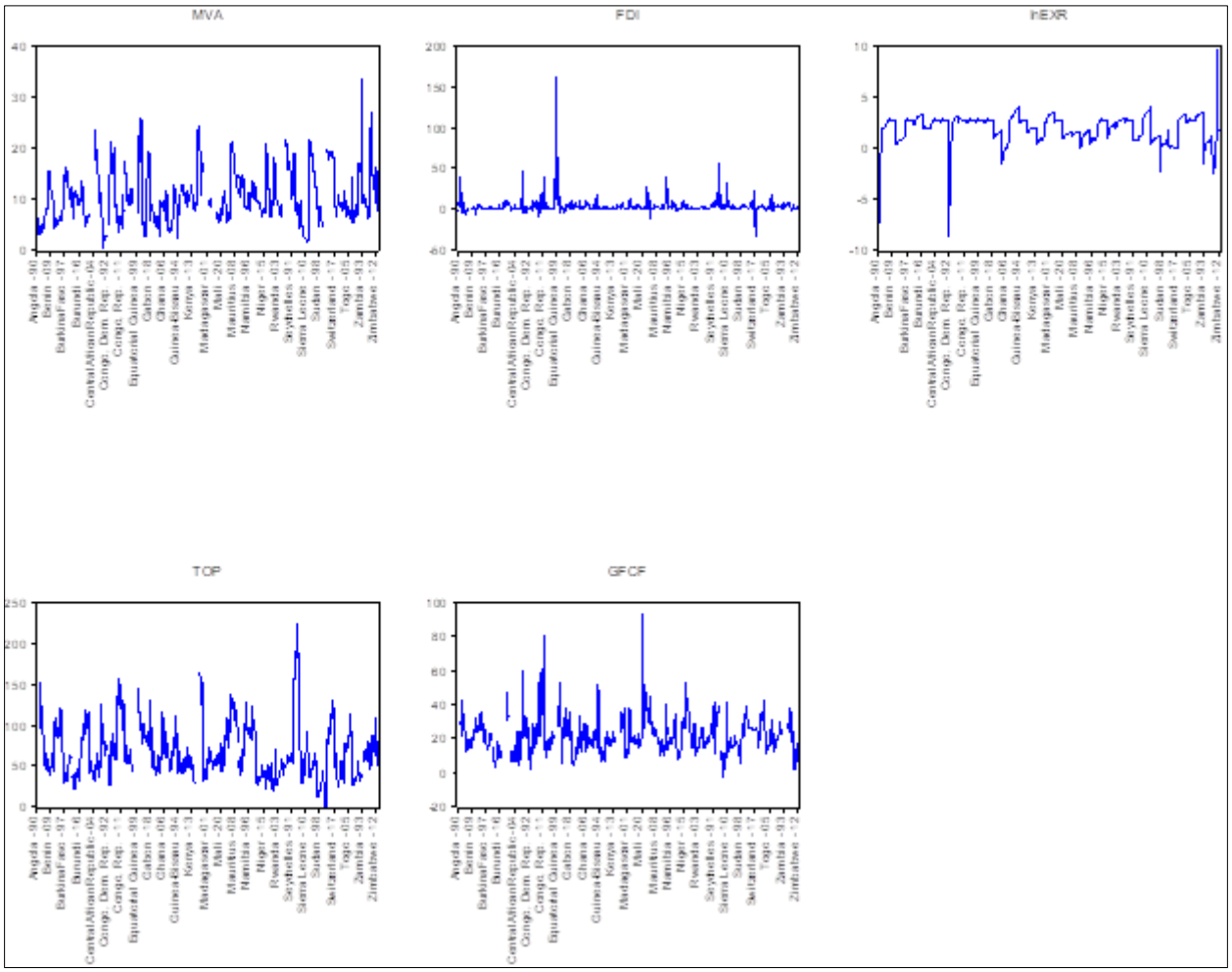

Figure 1 Graphical representation of model variables

4.3. Model Estimation

Table 3 Panel estimation results

Dependent Variable: D(MVA)				
Method: ARDL				
Sample: 2001 2008				
Included observations: 965				
Maximum dependent lags: 1 (Automatic selection)				
Model selection method: Akaike info criterion (AIC)				
Dynamic regressors (1 lag, automatic): FDI INEXR TOP GFCF				
Fixed regressors: C				
Number of models evalulated: 1				
Selected Model: ARDL(1, 1, 1, 1, 1)				
Note: final equation sample is larger than selection sample				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
	Long Run Equation			

FDI	0.015983	0.022609	0.706948	0.4798
INEXR	1.978906	0.266940	7.413287	0.0000
TOP	0.033762	0.006623	5.097970	0.0000
GFCF	-0.017009	0.013356	-1.273510	0.2032
	Short Run Equation			
COINTEQ01	-0.227425	0.048048	-4.733309	0.0000
D(FDI)	-0.001641	0.031015	-0.052908	0.9578
D(INEXR)	0.025620	1.857752	0.013791	0.9890
D(TOP)	0.006788	0.011275	0.602049	0.5473
D(GFCF)	-0.007295	0.017095	-0.426708	0.6697
C	0.733870	0.197156	3.722285	0.0002

The analysis of the model estimation results provides valuable insights into the dynamics of the manufacturing sector output (MVA) in both the long run and short run. Examining the long-run equation, the positive coefficient of Foreign Direct Investment (FDI) suggests a potential increase in MVA with rising FDI. However, the lack of statistical significance implies caution in interpreting this relationship, possibly due to delays in the translation of investments into productive capacity or the influence of unaccounted factors. Conversely, the positive and statistically significant coefficient for the logarithm of Exchange Rate (InEXR) implies a notable impact on MVA growth in the long run, possibly driven by the increased cost of imported inputs. Similarly, Trade Openness (TOP) exhibits a positive and significant coefficient, indicating that greater openness contributes significantly to the manufacturing sector's long-run expansion. Surprisingly, Gross Fixed Capital Formation's (GFCF) negative coefficient, though statistically insignificant, suggests a counterintuitive relationship that requires further investigation.

Transitioning to the short-run equation, the negative and statistically significant Error Correction Term (COINTEQ01) signals a rapid correction of around 22.74% of the previous year's disequilibrium, portraying a stable system that converges towards long-run equilibrium. However, the first differences of FDI, InEXR, TOP, and GFCF coefficients are statistically insignificant, indicating that these variables do not exert significant influence on short-run changes in MVA. This could imply a lag in the manifestation of their effects, emphasizing the importance of considering a more extended timeframe when crafting policies to stimulate manufacturing sector growth.

5. Conclusion

The conclusion of the study suggests that in the long run, Foreign Direct Investment (FDI) and Trade Openness (TOP) positively influence the growth of the manufacturing sector in Sub-Saharan Africa. This implies that an increase in FDI or a more open trade policy can lead to an expansion of the manufacturing sector over a longer time horizon. FDI can bring in capital, technology, and expertise, which can boost productivity and output in the manufacturing sector. Similarly, greater trade openness can provide access to larger markets and a wider variety of inputs, which can also contribute to growth.

However, Gross Fixed Capital Formation (GFCF), which represents investment in physical assets such as machinery, buildings, and infrastructure, has a negative impact on the growth of the manufacturing sector in the long run. This is somewhat counter-intuitive as one would typically expect investment in physical assets to enhance production capacity and hence contribute to growth. The negative impact could be due to factors such as inefficiencies in the use of capital, misallocation of resources, or inadequate maintenance and upgrading of physical assets.

Interestingly, the impacts of FDI, TOP, and GFCF are not significant in the short run. This could be because the effects of these variables take time to materialize. For instance, it may take time for FDI to translate into productive capacity, or for the benefits of trade openness to be realized.

Therefore, the study suggests that policies should be geared towards improving the investment climate to attract FDI and promoting trade openness to stimulate the growth of the manufacturing sector. At the same time, there is a need to

address the issues related to GFCF to ensure that investment in physical assets contributes positively to growth. The study also points to the need for further research to explore the reasons behind the negative impact of GFCF and ways to mitigate it. This could involve looking at factors such as the efficiency of capital use, the allocation of investment, the quality of infrastructure, and the maintenance and upgrading practices. Such research could provide valuable insights for policy-making and for improving the performance of the manufacturing sector.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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