



EFFECT OF INTERNATIONAL FINANCIAL INFLOWS ON PRODUCTIVE CAPACITIES IN AFRICA

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Abstract: This study investigated the effect of international financial inflows on productive capacities in Africa from 2010 -2022. Panel data robust standard error analytical technique and Generalized Method of Moments (GMM) were deployed to test for the effects of foreign direct investment (FDI), remittances (REM), and official development assistance (ODA) on productive capacities (PCI) in Africa with special focus on countries from different regions in Africa. Data for the analysis was sourced from the World Bank Development Indicator (WDI) and the United Nations Conference on Trade and Development (UNCTAD). The result showed that foreign direct investment harms productive capabilities in northern Africa but exerts a positive effect in the eastern and southern African regions. Remittances are statistically significant and have a positive effect on productive capacities only in eastern Africa. Official development assistance is also statically significant and exerts a positive effect on productive capacities in northern and eastern Africa. However, the effect of ODA in southern Africa is negative. The generalized method of moments results for the four regions revealed that foreign direct investment exerts a negative effect on productive capacities while remittance contributes significantly to productive capacities within Africa. Following the findings, the study concluded that international financial inflows play an important role in boosting productive capacities in Africa. The study therefore recommended governments of various

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countries to create an enabling environment and formulate policies that would stimulate foreign financial inflows especially remittances to thrive.

Keywords: Productive capacities, International financial inflows, and Generalized method of moment (GMM).

1. INTRODUCTION

One of the many challenges facing developing countries, particularly Africa, is low domestic savings, which poses a barrier to African economies financing capital investment. According to Ogbuabor et al (2023), statistical findings from the United Nations Conference on Trade and Development (UNCTAD 20222) show that Sub-Saharan Africa (SSA) has domestic savings of 17.5% of Gross Domestic Product (GDP) compared to other regions of the world, such as East Asia (45%), Pacific (45%) and South Asia (35%). Aside from being lower compared to other regions, savings rates in Africa have been steadily declining and stagnating for some years due to lower per capita income. To boast Africa's low saving and investment gap, international financial inflows play an important role in stimulating investments and executing capital projects to raise productive capacities and reduce poverty and unemployment in Africa. Remittances, official development assistance, and foreign direct and portfolio investments all contribute to international financial or capital inflows (Chorn and Siek,2017) The benefits of foreign financial inflows on investment in recipient nations, as well as how they further boost productive capacity and enhance commerce, have been underlined by economic theories and some empirical shreds of evidence. (Gnangnon 2023; Saha 2023 and Emako and Menza 2022).

Productive capacities refer to production resources, entrepreneurial capacities, and production linkages which together determine the capacity to produce goods and services and enable a country to grow and develop (UNCTAD, 2006). Schouame (2023) and Gnangnon (2019) regarded productive capacities as an indispensable element for LDC development. The 2006 UNCTAD report further demonstrates that in the least developed nations, particularly in Africa, the fundamental processes of capital accumulation, technological advancement, and structural change have been very weak, which has led to low labor productivity and widespread underemployment. The report classified natural resources, human resources,

financial capital, and physical capital as productive resources, or the components of production. Entrepreneurial capabilities concern the skills, knowledge, and abilities of enterprises to mobilize productive resources to invest in, innovate, and upgrade products and their quality, and to create markets. The two components of entrepreneurial capabilities are core competencies and technological capabilities; the former deal with routine knowledge, skills, and information in the production of and competition in goods and services, and the latter may be thought of as being concerned with advancing existing competencies. Production linkages refer to the flows and movements between enterprises and between different types of economic activity that take place in supply chain networks. (UNCTAD, 2022). In a similar vein, Osakwe (2020) agreed that to support sustainable economic development in Africa and achieve the SDGs, it is necessary to increase productive capacities, change domestic production structures to include manufacturing, and diversify export fields.

To boost structural change, advance technologically, and develop productive capacities, international financial inflows have steadily been on the increase in the last decade. For instance, foreign direct investment (FDI), to African countries reached a record of \$83 billion in 2021, accounting for 5.2% of worldwide FDI, up from 4.1% in 2020, (UNCTAD's World Investment Report 2022). Also, Remittances which describe the traffic in personal transfers, employee's compensation either within or across the country arising from residents living elsewhere other than their place/country of residence shows an upward surge from US\$474,939 to US\$714.249 billion between 2010 and 2020 in Africa. (Nwodo, 2023). This rise in remittance inflow represents about 50.39% globally (World Bank, 2020). Aside from foreign direct investment (FDI) and remittances, official development assistance (ODA) has equally served as major a source of international financial inflow to most developing countries contributing to output growth, and poverty reduction, and as a major source for augmenting domestic investment. ODA serves as capital accumulation for developing countries, especially in Africa (Orji 2022; Ogbuabor 2023).

Following a study conducted by the World Bank Group in 2022, Africa's, aid as a share of national income (ODA/GNI), rose from 0.31% in 2010 to 0.36% in 2022. Implying African countries receive the largest share

of total aid (33.6%), though this is down from 38% about a decade ago due to insecurity and threat in most of Africa. However, between 2021 and 2022, official development aid rose from US\$ 186 billion to US\$ 204 billion due to developed countries' increased spending on humanitarian aid and on processing and hosting refugees. (World Bank 2022). Figure 1 below shows a trend in ODA in Africa from 2000 to 2021. It can be observed that official development assistance has had an upward trend from 2019 to 2021

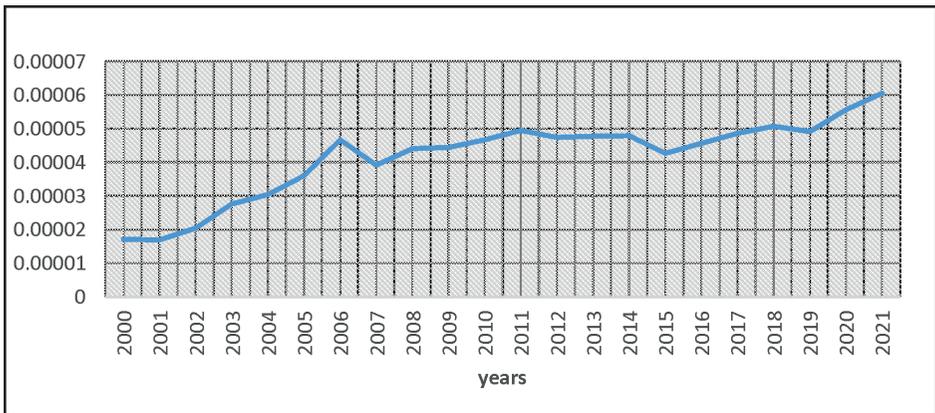


Figure 1: Official development aid received in Africa from 2000-2021

Source: Authors' plot using (WDI, 2022).

Despite the significant and increasing flow of international financial resources into Africa - including foreign direct investment (FDI), official development assistance, and remittances - the continent continues to struggle with low productive capacity compared to other regions worldwide, as shown in Figure 1.2 below. This discrepancy raises critical questions about the effectiveness of these financial inflows in increasing Africa's economic productivity and industrial development. The key problem is to determine whether these financial inflows improve or undermine local productive capacities, contribute to sustainable development, or lead to dependency and inefficiency. This research aims to examine the relationship between international financial inflows and the improvement of productive capacities in African countries, identify the factors that mediate this relationship, and evaluate the overall effectiveness of these financial resources on productive capacities in Africa.

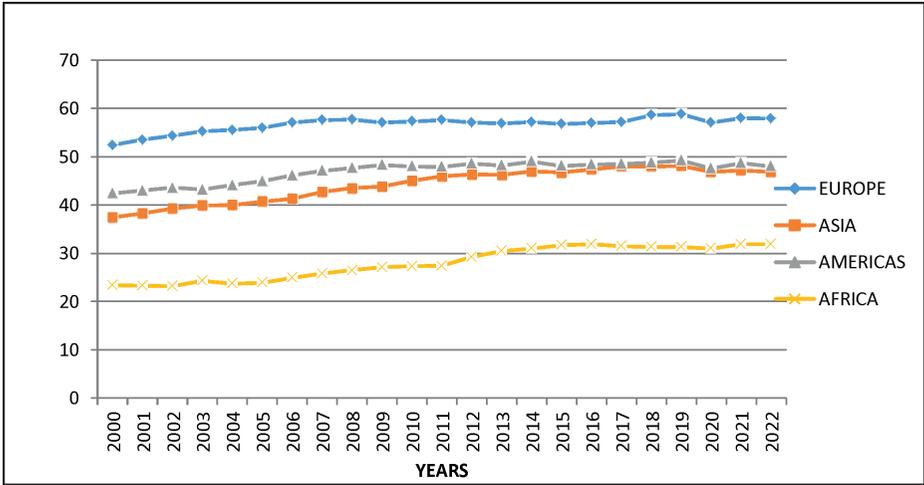


Figure 2: Overall productive capacities index across the world

Source: Authors' plot using UNCTAD, 2022 data.

Indeed addressing these issues necessitates an in-depth analysis to ascertain how international financial inflows can be optimized to effectively support the development of Africa's productive capacities and contribute to viable economic growth. Understanding these dynamics will offer valuable insights for policymakers, investors, and international organizations working towards the economic advancement of the continent. In other to achieve this, the following hypothesis was stated to capture the objective of the study.

Hypothesis 1: International financial inflows, such as remittances, foreign direct investment, and foreign aid, are not impacting significantly on productive capacities in Africa.

The rest of the paper is organized as follows. The next Section is an overview of the literature, while Section 3 presents the data and methodology. The empirical results are discussed in Section 4, while Section 5 concludes the paper.

2. LITERATURE REVIEW

The majority of the literature review in this paper hangs on the linkages between foreign direct investment, remittances, and official development assistance on some components of productive capacities such as human capital, private sector, structural transformation, energy consumption, and information and technology.

2.1. The linkages between foreign direct investment and productive capacities in Africa

Most of the studies adopted different econometric methodologies to establish the positive effect of foreign direct investment on labor productivity and human capital development in various countries and regions. (Saha 2023; lewin 2022; Okoye 2022 and Fagbemi and Osinubi 2020) others such as Trang et al. (2019) and Hanafy and Marktanner (2018) found a negative and insignificant effect of foreign direct investment on human capital development in Africa. Other studies such as Asongu and chamyou (2017), show an incremental impact of foreign aid on education and lifelong learning in 53 African countries for the period 1996–2010. While Otoo, Chen, and Ampah (2023) and Akpanke, et al (2023) found a positive impact and an interaction effect between foreign direct investment and renewable energy consumption in Africa.

2.2. The linkages between official development assistance and productive capacities in Africa

Edo, Matthew, and Ogunrinola (2023) identify the impact of disaggregated official development assistance (ODA) on economic growth and determine whether bilateral and multilateral aid has played a complementary role with the private sector, the government sector, and the external sector in promoting growth African sub-Saharan economies. The vector error correction model (VECM) and the generalized method of moments (GMM) are used to estimate the short- and long-term impacts over the period 1980–2020. The estimation results show that the effect of bilateral aid is positive and more significant than that of multilateral aid. However, their impact on economic growth is less significant than the impact of domestic private investment and government spending. Still, aid helped the private and public sectors promote growth.

In another study, Pradhan, Bennett, Nair, and Arvin (2023) analyses the long- and short-run associations between foreign development aid procurement, financial development, and institutional quality in resource-rich countries from 2005 to 2020, employing the panel vector error-correction (PVECM) model and Quantile-on-Quantile Regression (QQR). Our analysis shows that, in the short run, there is a strong endogenous nexus between foreign aid procurement, quality of institutions, and financial development. Furthermore, the results reveal that financial development and higher institutional development assist

resource-rich countries in procuring foreign developmental aid in the long run. These findings suggest that a financial system that functions well, and favorable institutional governance is critical for these countries to secure foreign aid to put them on a path to sustainability.

Consequently, Gnanon (2021) examined whether development aid contributes to improving productive capacities in recipient countries. The study considered two main components of total official development assistance (ODA), Aid for Trade (AfT) and NonAfT, the latter being part of the total ODA allocated to sectors other than trade-related sectors. The analysis is based on the total production capacity index recently developed by UNCTAD and covers 111 countries over the period 2002-2018. The results suggest that development aid, including its two main components, contributes to supporting productive capacities in recipient countries, with AfT flows having a greater positive effect on productive capacities than non-AfT flows. Furthermore, the positive effect of ODA on productive capacities in the least developed countries (LDCs) reflects the key role of both AfT flows and non-AfT flows in developing productive capacities. In contrast, in non-LDCs (countries other than LDCs in the overall sample), only AfT flows are positively significant for strengthening productive capacities, as non-AfT flows do not appear to have a significant impact on productivity development.

Wang and Dong (2021), evaluate the impact of official development assistance (ODA) on renewable energy development with evidence from 34 sub-Saharan African countries. The study adopts a panel threshold to explore the effects. The results show a non-linear relationship between the ODA and renewable energy development, indicating that the threshold effect doesn't exist.

2.3. The linkages between remittance and productive capacities in Africa

Ari (2022) investigated the effect of remittances on energy consumption with a focus on MENA countries over the 1977-2014 period. Using Wester Lund and Edgerton's (2007) cointegration test, the AMG estimator, and Dumitrescu and Hurlin's (2012) panel causality tests. The results of the cointegration test showed there is a long-term relationship between remittance inflow and energy consumption. According to the AMG estimator, remittance inflow has a positive impact on energy consumption, indicating that increases in remittances will be

followed by increases in energy consumption. The panel causality test displayed a bidirectional causal linkage between remittances Rahman et al. (2021) also examined the influence of remittances on energy consumption and focused on the four highest remittance recipient countries (India, Pakistan, Bangladesh, and Sri Lanka) in South Asia and analyzed the period from 1976 to 2019. The authors used the panel cointegration test from Pedroni (1999) and Kao (1999), the FMOLS and DOLS estimation techniques, and the Granger causality test. The empirical findings of the study showed there is a long-term relationship between energy consumption and remittances. According to the findings, remittance income has a positive impact on energy consumption. The outcome of the causality test showed a unidirectional causality, running from remittance to energy consumption. Rahman et al. also employed economic growth and urbanization as potential determinants of energy consumption and found a statistically significant and positive impact in the long run. energy consumption.

Mlambo and Ntshangege (2021), carried out a study to investigate the relationship between remittances and mobile technology in selected SADC states. The study employed the same panel co-integration techniques as Dumitreu and Hurlin (2012) to test the relationship. The results show causality runs from remittances to mobile subscriptions. This implies that remittances have an impact on mobile subscriptions but not vice versa.

3. DATA AND METHODOLOGY

This study used a panel of 34 African countries and covered the period 2010-2022 based on data availability. Countries include Algeria, Angola, Botswana, Burkina Faso, Cameroon, Chad, Congo, and the Democratic Republic of Congo. Rep., Ivory Coast, Egypt, Ethiopia, Gabon, Ghana, Guinea, Kenya, Madagascar, Mali, Mauritania, Morocco, Mozambique, Namibia, Niger, Nigeria, Senegal, South Africa, Sudan, Tanzania, Togo, Tunisia, Zambia, and Zimbabwe. Table 2 shows the description of the variables in the study and the data sources. The Productive Capacity Index (PCI) is used as the dependent variable in this study. The. The productive capacity index (PCI) is used as the dependent variable in this study. The core independent variables are FDI inflow, remittances received (REM), and foreign aid inflow (ODA). These variables are used as measures of international financial inflows in line

with the extant literature (Ogbuabor et al. 2023 Gnangnon (2021). These financial inflows are expected to boost economic productive capacities in Africa.

Other independent variables included in the study are trade openness, government effectiveness, and exchange rate. All these variables are expected to impact productive capacity in Africa positively.

Table 1: Variable description and data sources.

<i>Variables</i>	<i>Measurement</i>	<i>Source</i>
Productive capacity index(CPI)	Productive capacity index(CPI)	United nations conference for trade and development(UNCTAD)
Foreign direct investment(FDI)	inflow (FDI) Net foreign direct investment inflows (% of GDP)	World Development Indicators (WDI), https://databank.worldbank.org/source/world-development-indicators
Remittances (REM)	Remittances received (% of GDP)	World Development Indicators (WDI), https://databank.worldbank.org/source/world-development-indicators
Foreign aid(ODA)	Official Development Assistance (constant 2020 US\$)	World Development Indicators (WDI), https://databank.worldbank.org/source/world-development-indicators
Trade openness	Trade(% of GDP)	World Development Indicators (WDI), https://databank.worldbank.org/source/world-development-indicators
Government effectiveness(GEF)	Regulatory Quality: Estimate	World Governance Indicators (WGI) www.govindicators.org
Exchange rate(EXCH)	Real effective exchange rate index (2010 = 100)	World Development Indicators (WDI), https://databank.worldbank.org/source/world-development-indicators

Source: Authors' compilation

The descriptive statistics of the variables in Table 3 indicate that the productive capacity index has an average score of 34.263, suggesting that productive capacities in Africa are low on average. We also find that FDI, remittances, and foreign aid (ODA) recorded mean values of 4.157, 4.336 and 1.891 respectively. All the variables exhibited some variations as shown by the standard deviations.

Table 2: Descriptive statistics

<i>Variables</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>	<i>Obs</i>
PCI	34.222	9.507	15.9	54	429
REM	4.336	5.265	0	27.302	429
FDI	4.157	5.698	-.521	39.811	429
EXCH	22..256	32.780	1.43	40.76	429
ODA	1.891	2.533	.321	19.144	428
GEF	.203	.027	.165	.304	429
TOPEN	71.885	48.934	2.699	347.997	429

Source: Authors' computation using STATA 15.

The matrix of correlation presented in Table 3 reveals that the variables exhibit associations that are not precisely linear or perfect. Therefore, the model is free from the issue of multicollinearity, which tends to introduce biases in our model. Specifically, there is a positive relationship between Productive capacities (PCI), foreign direct investment (FDI), remittances (rem) Government Effectiveness (GEF), and Trade Openness (TOPEN). But there exists a negative relationship between exchange rate (EXCH) and productive capacities

Table 3: Matrix of correlations for 34 selected African countries

variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) PCI	1.000						
(2) FDI	0.039	1.000					
(3) REM	0.388	0.361	1.000				
(4) GEF	0.301	-0.128	-0.010	1.000			
(5) TOPE	0.287	-0.050	0.045	0.199	1.000		
(6) ODA	-0.394	-0.324	-0.896	-0.205	-0.160	1.000	
(7) EXC	0.006	0.018	-0.064	0.111	0.017	0.052	1.000

3.2. Model specification

To answer the research question raised by this study, the researcher followed Gnanon (2021) by specifying a panel model in their implicit forms as follows,

$$PCI_t = f(FDI, \log ODA, REM, GEF, TOPEN, EXCH) \quad (1)$$

To facilitate estimation, we specify the models explicitly as dynamic panel data models as follows:

$$\begin{aligned}
 PCI_{it} = & \alpha_0 + \beta_1 PCI_{it-1} + \beta_2 FDI_{it} + \beta_3 \log ODA_{it} + \beta_4 REM_{it} + \beta_5 GEF_{it} \\
 & + \beta_6 TOPEN_{it} + \beta_7 EXCH_{it} + \mu_{it}
 \end{aligned}
 \tag{1}$$

Where α_0 is the intercept for the country 'i', β 's- the slope, and μ_t , η_i , and ε_{it} - the error. i represent individual countries, t represents the year in chronological order, and $t > 0$. The error term was decomposed as $\mu_{it} = \theta_{it} + \eta_{it} + \varepsilon_{it}$, while ε_{it} is the standard or the stochastic error term, and it varies across different countries and years, θ_{it} is a set of the group (country) specific characteristic or effect, which then refers to each country of the model, and η_i is time-specific effects. PCI is the productive capacity index a measure of productive capacities in the current year, and the dependent variable in the model, PCI_{it-1} represents the lag value of the productive capacity index, FDI is Foreign direct investment, $\log ODA$ represents the log of official development assistance, and REM is Personal remittances received. GEF represents Government effectiveness. TOPEN is trade openness and EXCH represents real exchange rate.

4. EMPIRICAL RESULT

Table 5 shows the results of the one-stage system generalized method of moments (GMM) regression. This table summarizes the results of the study objective. The time and cross-sectional effects are not considered in this study because they were found to be insignificant in simulations. At 5%, the first lag of the production capacity index (PCI) is statistically significant and has a positive relationship with the current value of the dependent variable (PCI). This means that the previous level of production capacity in these countries positively improves the current level of production capacity. In the short term, a 1% increase in the previous period increases the present by about 0.693% on average. The FDI outcome is statistically significant but negatively related to productive capacity in Africa. This means that if foreign direct investment increases by an average of 1%, production capacity in Africa will decrease by about -0.174% in the short term, other things being equal. However, this result is not surprising as one can argue that foreign direct investors are repatriating capital to their countries rather than investing in productive capacity in Africa where these profits are made. Personal remittances received are statistically significant and positively impact productive capacities in Africa. This implies

that a percentage change in remittances received in Africa will increase productive capacities by 10.7%.

This result is a recent confirmation as to why remittance has overtaken FDI and ODA and is the major source of international financial inflows in Africa. Relatives and family friends who invest remittances received into entrepreneurial ventures help in boasting productive capacities in Africa. The trade openness coefficient (TOPEN) and p-value show a statistically significant association with PCI. This means that trade openness has a positive impact on production capacity in Africa. The above result shows that changes in trade openness policies in Africa can increase productivity capabilities by about 11%. This result also supports the descriptive statistics which revealed that the mean value of trade openness is on average around 12.69, which is considered to be expected. The result also confirms the Bretton Wood trade liberalization principle, especially for developing countries, and the empirical work of Ijirshar (2016).

Furthermore, the Government Effectiveness coefficient (GEF) is statistically significant for the impact on productive capacity in Africa. This means that if the perception of the quality of public services, the quality of the

Table 5: One-step System GMM Short Run Regression Results

<i>pci</i>	<i>Coef.</i>	<i>St.Err.</i>	<i>t-value</i>	<i>p-value</i>		[95% <i>Conf</i>	<i>Interval]</i>	<i>Sig</i>
L	.693	.089	7.75	0		.518	.869	***
FDI	-.174	.069	-2.52	.012		-.309	-.038	**
REM	.107	.038	2.82	.005		.033	.182	***
TOPEN	.011	.003	3.49	0		.005	.018	***
GEF	19.748	8.326	2.37	.018		3.428	36.067	**
LNAID	.017	.019	0.88	.379		-.021	.055	
EXCH	-.002	.001	-3.13	.002		-.004	-.001	***
CONSTANT	8.533	2.376	3.59	0		3.876	13.19	***
Mean dependent var	34.489				SD dependent var	9.382		
Number of obs	395				Chi-square	411624.110		
*** p<.01, ** p<.05, * p<.1								

Notes: AR(1) and AR(2) denote the Arellano-Bond test for first and second-order autocorrelations respectively; St. Err. = standard error; Coef. = coefficient; ln = natural log.

Source: Authors' Computation using STATA 15.0

public service, and the degree of its independence from political pressure, as well as the quality of policy formulation and implementation, are successful, production capacities will increase by 19.74%. This result is not worrying since in most developing countries, particularly in Africa, the government still creates an enabling environment and supports productive development projects by providing access to investment funds. This result also highlights the rationale for government involvement in large capital-intensive projects in any economy. Finally, the exchange rate coefficient (EXCH) is statistically significant but harms production capacities in Africa. On average, a change in the exchange rate leads to a decrease in production capacity in Africa by about -0.002. When the price at which one currency is exchanged for another is high, this affects the flow of capital to build productive capacity in Africa. This result is consistent with the findings of Ekiou (2023).

Table 5 houses the regression diagnostic tests applicable to the generalized method of moments (GMM) estimation. Both the Sargan and Hansen tests are tools used to test for over-identifying restrictions otherwise known as exogeneity of instruments. Hansen test is the most popular test usually reported in the literature thus emphasis will focus more on it. Both tests however reveal that the employed instruments are not weak hence they are exogenous. Specifically, the Hansen test of exogenous instruments shows that the null hypothesis of instrument homogeneity cannot be rejected at the 5% level hence we conclude that the model instruments are exogenous. This easily be observed from the large *p-value* of 0.324 corresponding to the Hansen test which is larger than the 5% conventional level.

Similarly, first and second-order serial correlation tests for GMM proposed by Arellano and Bond (1998) are shown by the AR (1) and AR (2) tests. Theoretically, it has been demonstrated that first-order serial correlation is always expected after GMM estimation but that is not of major interest. The major interest is in the second-order serial correlation represented by the AR (2). In our case here, the AR (1) and AR(2) tests show that the null hypothesis of zero correlation of error term between two time periods cannot be rejected at 5% implying that regression residual is not serially correlated at both the first and second lags. This result makes the estimated model reliable.

Table 6: Regression diagnostic tests

Tests	<i>Chi-Square Statistic</i>	<i>P-value</i>
<i>Sargan</i>	0.98	0.807
<i>Hansen</i>	4.66	0.324
<i>AR(1)</i>	-6.64	0.000
<i>AR(2)</i>	1.08	0.282

Source: Researchers' construct

5. CONCLUSION AND POLICY RECOMMENDATIONS

This research was motivated by the lack of literature on international financial inflows and productive capacity in Africa. Much of the existing literature focuses on the impact of financial inflows on indices of productive capacities such as production, human capital, infrastructure development, energy, etc. This study therefore uses an innovative analytical approach to examine how foreign financial inflows affect the productive capacities of Africa as a whole. The study used the System GMM framework. The results suggest that foreign direct investment (FDI) has a negative and significant impact on the productive capacities of African nations, which is consistent with the findings of Grob & Danzinge (2022) and Saha (2023). Personal remittances (REM) have a significant positive impact on productive capacity in Africa and are consistent with recent statistics indicating that remittances are the main source of international financial inflows in African countries. Official development assistance (ODA) does not have a statistically significant impact on productive capacity in Africa. The above findings have important policy implications. First, policymakers and leaders in Africa are advised to adopt different strategies when it comes to foreign direct investment in Africa, as these have been proven to impact productive capacity on the continents. One of these strategies to bridge the gap between foreign direct investment and productive capacity could be the development of PCI-supported FDI-led growth or FDI-induced productivity response absorption measures, in which foreign investors commit to improving productive capacities in host countries before they Return capital to home countries development. Real sectors should receive these investments. Second, since remittances have a positive impact, individual country governments and relevant policy stakeholders need to develop policies that facilitate the flow of remittances to the continent. In addition, recipients should be encouraged to invest part of their remittances in productive ventures to increase the overall

level of productive capacity in Africa. Third, harnessing the impact of ODA in Africa requires the development of robust institutions, improved government efficiency, and changes in the mental framework of each country's government regarding foreign aid to enable the majority of this aid to be directed toward the creation of productive capacity. There is a high recommendation for policy regarding ODA in Africa. Fourth, relevant government agencies responsible for the export and import of goods and services should work to improve existing international trade policies and formulate and implement further trade agreements that provide productive capacity in Africa.

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